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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

COMPLETED

78

The Treasury Department And Its Bureaus Can Better Plan For And Control Computer Resources

The use of computer resources throughout Treasury could be improved with more effective guidance and better overall management. Computer resources in many Treasury bureaus either exceed or fall short of program requirements they are intended to support. The results are unnecessary costs and unmet user needs.

The Paperwork Reduction Act of 1980 offers a significant opportunity for Treasury -- as well as other Federal agencies -- to improve planning, coordination, and accountability over computer resources. This report discusses the potential of the act for improvements at the Department and bureau level and contains recommendations for implementing certain of the act's provisions. GAO also develops a framework of well recognized planning and control procedures that can substantially increase the active involvement and direct participation of top officials and users in the management of computer resources.

UNITED STATES GENERAL ACCOUNTING OFFICE

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I

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II

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This report describes the Department of the Treasury's problems in managing its computer resources and recommends ways to solve them. We made our review because of the Congress' sustained interest in improving the management of information resources.

The problems discussed in our report range from the acquisition of unneeded computer capacity to the belated replacement of overloaded and obsolete equipment. These result in unnecessary costs, unmet user needs, and inefficient use of computers.

We are sending copies of this report to the Director, Office of Management and Budget; and to the Secretary of the Treasury.

Charles A. Bowsher
Comptroller General
of the United States

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

THE TREASURY DEPARTMENT AND ITS BUREAUS CAN BETTER PLAN FOR AND CONTROL COMPUTER RESOURCES

DIGEST

GAO conducted this review to examine how well the Department of the Treasury and its bureaus use computer resources in achieving their missions. By analyzing previous internal reviews and performing detailed examination work at selected facilities, GAO identified instances where computer resources are insufficient or in excess of the requirements of programs they are intended to support. GAO developed a framework of generally recognized principles and procedures to improve the planning and control of computer resources by top management and users.

TREASURY CAN PROVIDE STRONGER DIRECTION FOR MANAGING COMPUTER RESOURCES

The Department of the Treasury has lacked an effective means of implementing policies and procedures for managing computer resources. Treasury's Office of Computer Science has been hampered in this regard by limited staff and authority and by conflicting roles and objectives. (See p. 6.)

The Paperwork Reduction Act of 1980 affects a wide range of information-related activities throughout the Government, including data processing. Among its provisions is one that mandates responsibility and accountability at the Departmental level for managing computer resources within the bureaus. Specifically, the act requires the designation of a senior official within Federal agencies to report directly to the head of the agency and to be held accountable for, among other things, effectively and efficiently managing all of the agency's computer activities. (See p. 10.)

Treasury should ensure that the senior official it designates has the authority and staff to effectively carry out all of the act's requirements, including those concerning the management of computer resources.

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To avoid conflicts between program and regulatory responsibilities which may affect the senior official's effectiveness, GAO believes that his or her responsibilities should be limited to those required to implement the act. Similarly, assigning additional duties to the senior official detracts from the importance of his or her responsibilities and limits the act's potential for improvements.

COMPUTER RESOURCE MANAGEMENT CAN ALSO BE IMPROVED AT THE BUREAU LEVEL

Many Treasury bureaus have incurred unnecessary costs and are not realizing the full potential of automatic data processing. Assuring that computer resources are consistent with overall needs requires a coordinated effort from three levels of an organization: top management, user management, and data processing management. A well-recognized means of achieving this interaction is to establish an executive steering committee of management from these levels to plan and allocate computer resources and control their use. To ensure that the committee has agencywide perspective, it should be chaired by the agency head or deputy.

Because the Bureau of Engraving and Printing did not have a long-range strategy for identifying and coordinating users' needs, computerized information systems were initiated and sometimes completed only to be abandoned when it was discovered that other requirements had not been considered. (See p. 24.)

Inadequate long-range planning at the Customs Service has resulted in the development of a computerized law enforcement system without a strategic assessment of the system's potential growth. As a result, the system is programmed in nonstandard language that can be only run on one manufacturer's computer, there is a backlog of requests for additional uses that is not handled systematically, and several uses had to be discontinued since data cannot be entered into the system in time to be useful. (See p. 26.)

At the Bureau of Government Financial Operations, failure to adequately assess the long-term implications of computer technology has resulted in obsolete, saturated equipment that has increased operating costs, prohibited automation of several functions, and seriously jeopardized the accomplishment of its primary mission. (See p. 27.) Similarly, the Secret Service did not adequately identify computer resource requirements and consequently acquired two identical, high-performance computers when one is sufficient for its needs. (See p. 28.)

At the Customs Service and the Bureau of Engraving and Printing, new applications were proposed and initiated without a clear understanding between users and systems development staff as to what was needed. (See pp. 35 and 38.) Other systems were developed with key design phases either performed out of sequence or else omitted entirely. As a result, systems have required redesign or continual modifications, took too long to develop and cost too much money, and still do not meet users' requirements.

The Bureau of the Public Debt almost awarded a sole-source contract for computer processing services that would have cost $1.3 million over an 18-month period. (See p. 42.) Although a feasibility study for the procurement had been prepared, it did not address a number of basic issues and generally failed to demonstrate the urgency or severity of the problem or how the procurement would resolve it. On the basis of the deficiencies identified by GAO, the procurement was subsequently cancelled.

For optimal effectiveness in planning for and controlling computer resources, bureaus should have a coordinated and systematic computer performance management program. GAO found that computer utilization statistics collected at the Bureau of the Mint's computer center are not being used correctly or interpreted properly, resulting in unused processing capacity. (See p. 47.)

GAO believes that most, if not all, of the planning and systems development problems identified at Treasury bureaus could have been detected earlier, and the effects alleviated, had the bureaus had an effective performance management program in place.

RECOMMENDATIONS

To ensure that computer resources support Treasury's operations as effectively and efficiently as possible, GAO recommends that the Secretary of the Treasury:

--Ensure the senior official designated under the provisions of the Paperwork Reduction Act of 1980 has the staff, authority, and independence commensurate with the responsibilities and importance of the position. (See p. 16.)

--Direct the senior official to ensure that bureaus institute procedures for effective computer resource planning by establishing steering committees, chaired by the Bureau head or deputy, and charged with assessing requirements on a periodic basis and formulating an effective, coordinated growth strategy. Bureaus should also expedite the development and installation of computer resource cost accounting systems. (See p. 29.)

--Direct the senior official to ensure that bureaus implement effective system development procedures that have a formalized role for the steering committee and users in the process. (See p. 43.)

--Direct the senior official to have bureaus establish comprehensive and coordinated computer performance management programs appropriate to the amount of resources within the bureau and responsible for providing management the necessary data for informed decisionmaking. (See p. 52.)

AGENCY COMMENTS

The Department of the Treasury agreed that Departmental oversight of computer resources needs to be strengthened but does not believe GAO has shown that management attention has been insufficient under current arrangements. Treasury also disagrees with GAO's recommendation that the duties of the senior official should be limited to those required to implement the Paperwork Reduction Act of 1980. The Department believes that this would result in the establishment of a new Assistant Secretary for computer management and would therefore be too costly and would isolate computer resource management from other information-related areas.

GAO believes that many of the problems it identified could have been avoided or else detected earlier had Treasury maintained effective oversight at the Departmental level.

GAO recommends neither a separate position of Assistant Secretary for computer management nor the acquisition of additional staff and other resources. GAO recommends that the duties of the senior official be limited to those required by the act so that the act can attain its full potential for effecting improvements. In order to make the official's authority, both real and perceived, commensurate with the responsibility that the position entails, the official needs a rank equivalent to other top administrators reporting to the Secretary. At a minimum, the official should have the same rank as that of an Assistant Secretary. This can be accomplished by restructuring the Department's present organization and realigning existing resources and responsibilities.

Treasury generally agreed on the need to improve long-range planning, systems development, and computer performance management in the Department's bureaus, and said actions to improve these activities will be taken. However, it was unclear from the Department's comments as to what extent the general approach developed by GAO in this report will be followed. Specifically, Treasury believes that, because of the differences in resources and missions in the bureaus, a steering committee is not appropriate for each bureau and policies for computer resource management should not be the same throughout the Department. GAO believes that the approach for managing computer resources discussed in this report is essential for each Treasury bureau regardless of its size or mission.

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CHAPTER 1

INTRODUCTION

The Department of the Treasury has a vital role in the Government with responsibilities as diverse as they are critical: formulating domestic and international financial, economic, and tax policies; serving as the financial agent for the U.S. Government; enforcing a wide range of different laws; and manufacturing coins and currency. Over 125,000 employees in 11 bureaus and in various offices carry out these responsibilities. The flow of information necessary for these activities--to and from the public, across the Government, and within the Department itself--is enormous.

The Department of the Treasury depends a great deal on computer technology to accomplish its various missions and programs. For fiscal year 1981, Treasury's total operating budget for computer equipment, personnel, and services was about $641 million. Data processing operations throughout the Department have grown continuously over the past several decades, to the point where many Treasury functions could not be conducted at all were it not for the high-speed processing of huge volumes of information that computers permit. Yet there is more to computer technology than just equipment. People must determine the data processing needs of the organization, decide the best means of meeting these needs, and ensure that computer technology continues to make a maximum contribution towards reaching the organization's goals. Too frequently, however, this oversight function is not given the emphasis or attention it requires from those most dependent upon computer resources.

To assure that computer technology best contributes to overall goals and objectives, it is vital that the total needs of the organization be identified and considered. This, in turn, necessitates the active involvement and direct participation of appropriate representative management throughout the entire organization in the planning and controlling of computer resources. Computer technology, just as any other resource used within an organization, should be the concern of the head of the agency and individual users as well as of those directly responsible for providing and maintaining the resource. This report discusses how Treasury can improve the contributions made by its computer resources in achieving Department objectives by establishing a management framework to allow for increased input and accountability of top management and users in the decisionmaking process for computer technology.

THE NEED FOR TOP MANAGEMENT AND USER INVOLVEMENT IN MANAGING COMPUTER RESOURCES

In the past, the management of computer resources was primarily the concern of the organizational entity responsible for providing data processing services. Computers had a special mystique and were generally regarded as "black boxes." However, the increasing importance of information to government agencies has brought about a realization that computer technology is not an end in itself but a means to an end. As such, the planning and controlling of computer resources can no longer be restricted to those responsible for providing the service but must include those utilizing the service as well.

The lack of top management and user involvement in managing computer resources is a commonly cited problem throughout the Federal Government. Perhaps the best summation of the situation was by the Federal Data Processing Reorganization Project, which reported to the President in April 1979 that one of the principal reasons why agencies were not exploiting the potential opportunities available through increased use of computers was the "abdication by program agency management of its responsibility for managing information technology as a mission-oriented resource." The study concluded:

> "On the one hand, the prudent application of information technology to agency or program missions should and must be the primary responsibility of agency or program management; on the other hand, the study teams found that, in general, agency or program managers do not exercise the required responsibility, and that the users of data processing services in the Federal Government are seldom held accountable either for the effective use of such services or for planning and justifying the use of similar services in the future."

Steering committees can provide guidance and direction in managing computer resources if properly implemented

A much recognized and accepted means of providing the necessary input to the management of computer resources is the formation of an executive steering committee composed of senior management from every major organizational group, including the data processing function, and chaired by the agency's head or deputy. A steering committee can bring an agencywide perspective to data processing operations by

--developing and disseminating policy guidance,

--preparing a coordinated long-range plan for the orderly acquisition or enhancement of computer resources, and

--monitoring the use of computer resources to ensure they are providing the most effective and efficient support of agency programs.

Over the past several years, GAO has issued numerous reports to the Congress and agency heads stressing the necessity of top management and user participation in the planning and control of computer resources. These reports have also advocated executive steering committees as a means of assuring that computer resources support the agency's mission with maximum effectiveness and efficiency. Within the Department of the Treasury, similar conclusions have been reached by internal auditors and management consultants. Most of Treasury's bureaus have responded in a positive manner to these studies and have established steering committees for computer resources. However, where committees have been established, some are less than fully effective. A steering committee that does not have a formalized role in the planning process for computer resources and adequate control over these resources cannot function as it needs to.

This report reemphasizes the importance of establishing executive steering committees to assure the active involvement and direct participation of program management in the management of computer resources. It also discusses the specific roles of top management and users in the planning (ch.3) and systems development (ch.4) processes and how a computer performance management program (ch.5) can improve the committee's control over computer resources. Chapter 2 discusses how Departmental control over computer resources in Treasury's bureaus can be strengthened.

OBJECTIVES, SCOPE, AND METHODOLOGY

Computer resources--hardware, software, and people--are a valuable asset critical to the accomplishment of Treasury's missions and program objectives. The purpose of our review was to evaluate how effectively these resources are managed by the Department and its bureaus, determine if they could be better used, and recommend improvements where needed. The focus of our work was on top management and user management rather than on management at the computer facility or data processing function.

In this review, we have synthesized problems and deficiencies that we observed, as well as those previously identified by others, so that we could address a wide range of issues in terms of causes rather than symptoms. In our opinion, all of the problems discussed in this report relate primarily to the need for increasing the active involvement and direct participation of senior agency officials and data processing users in the management of computer resources. To this end, the report presents a conceptual framework of well-recognized procedures chosen because experience has shown that they can substantially increase the input from top management and users in the planning and control of computer resources.

To carry out our review, we

--examined policies, procedures, and guidelines established at the Department and bureau levels for managing data processing resources;

--analyzed plans, studies, previous internal and external audits and management reviews, and other documents relating to computer resources within Treasury and its bureaus; and

--interviewed various program managers and data processing managers throughout the Department of Treasury as well as individual users of several of the bureau's automated information systems.

Our review was performed in accordance with GAO's current standards for audit of governmental organizations, programs, activities, and functions. Although we reviewed the use and management of computer resources at all of the Treasury bureaus, most of our detailed examination work was conducted at the Bureau of the Mint's data center in San Francisco, California; the Customs Service's data center in San Diego, California; and the Bureaus of Engraving and Printing, Government Financial Operations, and the Public Debt, and the Secret Service in Washington, D.C. We chose these locations because of the size of their computer operations relative to other Treasury bureaus and because previous internal reviews had indicated a number of problems and deficiencies which, in our opinion, are symptomatic of a need to increase top management and user involvement in planning and controlling computer resources. We did not review computer operations at Treasury's largest user of these resources, the Internal Revenue Service, since we had evaluated the Service's management of these resources earlier using generally the same criteria as in this report. [1]

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[1] "IRS Can Better Plan For And Control Its ADP Resources" (GGD-79-48, June 18, 1979).

CHAPTER 2

TREASURY CAN BETTER MANAGE COMPUTER RESOURCES THROUGHOUT THE DEPARTMENT

In the past, the Secretary of the Treasury has not had an effective, Departmental level means of controlling the large amount of computer resources in the Department's bureaus and offices. The Secretary's designated focal point for data processing activities, the Office of Computer Science, had limited staff and lacked the organizational stature to function properly. Guidelines and policies intended to improve data processing operations throughout the Department were seldom enforced. In addition, the Office had several roles which often conflicted or interferred with its function of assuring computer resources were used throughout the Department in the most efficient and effective manner.

The lack of an effective oversight function for Treasury-wide computer resources at the Office of the Secretary level has had a significant effect on how well these resources are used by the Department's bureaus. The Office of Computer Science had the potential of serving as a valuable review mechanism to identify serious problems as well as opportunities for improved economy and efficiency. We believe that many, if not all, of the deficiencies discussed in this report could have been prevented or substantially alleviated had an effective Department-wide review process with sufficient authority been in place. Because the Office of Computer Science was not placed high enough in the Treasury's organizational structure, had limited personnel to function properly, and had conflicting roles, we do not believe the computer operations within Treasury's bureaus have received the necessary emphasis and support from the Departmental level.

Recent legislation, if properly implemented, will significantly improve the management of all of Treasury's information resources, including those that are computer related. The Paperwork Reduction Act of 1980 (Public Law 96-511) requires, among other things, that the Secretary of the Treasury designate a senior official to report directly to the Secretary and be accountable to the Secretary for the efficient, effective, and economical management of the Department's information resources. We believe that the designated senior official will provide a much more effective means of control for the Secretary to better manage computer resources than the Office of Computer Science was capable of. Once fully implemented, the act's provisions will provide the emphasis, coordination, and accountability at the Office of Secretary level that is necessary to oversee computer resources on a Departmentwide basis. For the the act to have maximum effectiveness, Treasury should ensure that the senior official is not encumbered with problems similar to those that faced the Office of Computer Science.

TREASURY HAS LACKED EFFECTIVE, CENTRALIZED CONTROL OVER COMPUTER RESOURCES

In April 1973, the Department of the Treasury established an Office of Computer Science under the Assistant Secretary for Administration. The Office was charged with three responsibilities: operating a Departmental computer center; serving as a central technical resource and the Secretary's focal point for computer resource procurements; and developing, recommending, interpreting, and evaluating adherence to and effectiveness of Departmental data processing policy.

Most of the Office's emphasis has been on operating the computer center. Developing and implementing Department-wide policy and procedures for managing computer resources has suffered from limited resources, insufficient authority, and the inherently conflicting nature of the Office's responsibilities.

The Office of Computer Science has lacked staff and authority to effectively oversee computer resources

The Office of Computer Science has made a number of efforts to improve the management of data processing resources throughout the Department of the Treasury. Since its inception, the Office has issued a series of orders and directives intended to provide Departmental guidance and direction to bureaus on the proper management of computer resources. These issuances have been compiled in a handbook issued to bureaus which contains a wide range of policies and specific procedures which, had they been uniformly enforced, could have done much to improve computer operations throughout the Department. For example, many of the elements of long-range planning, computer performance management, and systems development procedures that we found lacking in Treasury bureaus, as discussed later in this report, are called for in the Department's handbook.

The Office, however, had limited resources to see that these policies and procedures were carried out. Of a total of 58 authorized positions in the Office of Computer Science, 5 are assigned to its oversight function and the remainder to the computer center. This ratio has remained approximately the same since the Office was established.

The handbook also requires periodic reviews of each bureau's computer facilities and furnishes guidelines to be used in evaluating them. Although these reviews can be an excellent vehicle for identifying problems with data processing operations, alerting other bureaus to the kinds of problems that sometimes arise, and sharing solutions or preventive measures among the bureaus, only three of these reviews have been accomplished. During our review, we noted a number of other worthwhile projects planned or initiated by the Office of Computer Science to improve data processing operations, such as developing Department-wide programming standards, computer resource cost accounting systems, and processing capacity measuring systems. According to the Office's acting director, these efforts were not completed because of insufficient staff.

We believe the Office of Computer Science has also been hampered in its efforts to implement and enforce the policies and procedures it has issued because it is placed relatively low within the organizational structure. Because of its location, the Director is in the position of trying to implement policy and effect improvements by dealing with bureau heads who are more senior in grade. Furthermore, the Office lacks direct access to the Secretary since it is under the Assistant Secretary for Administration. We believe that this has resulted in bureaus having a diminished perception of the importance of the role the Office of Computer Science is supposed to play, thereby increasing the difficulty of implementing policy. For example, several officials we spoke with in the bureaus told us they tended to ignore the Office's directives when possible and did not think it worthwhile to consult the Office for advice, assistance, or guidance.

The Office of Computer Science has conflicting responsibilities

The Office of Computer Science operates a large computer center in the Department's headquarters building with a staff of 53 and an annual operating budget of about $4 million. Processing time is made available to any Treasury bureau or office that requests it and to other Government agencies if it is available. The Office is also responsible for reviewing bureau procurement requests for computer equipment or services. In this regard, the Office serves as a technical consultant by advising and assisting the bureaus in accomplishing the multitude of complex tasks and following the complicated procedures involved in a successful procurement. These responsibilities, in our opinion, conflict with one another and have kept the Office from focusing on overseeing the Department's computer resources.

Several officials we spoke with in the Department and in the bureaus told us that because the Office of Computer Science operates its own data processing center, they were concerned that the Office's regulatory actions might be self-serving. Some believed the Office may have been disapproving procurement requests, or in some cases delaying or hindering them, in order to keep or acquire the requestor as a customer for its own service center. This possibility was also raised in a 1975 review of the Office of Computer Science by Treasury's Management Analysis Division which reported that other officials had similar concerns.

We believe that attempts to develop and implement policy or procedures are also likely to be questioned since there might be doubt as to the extent to which they are enforced in the Office's own center. An organizational entity charged with enforcing policies and procedures throughout the organization should not, in our opinion, conduct the same operation itself that it is reviewing and evaluating elsewhere. To do so decreases the independence and objectivity required by the reviewing unit and invites accusations of selective enforcement.

We did not attempt to determine the validity of the accusations concerning the appropriateness of actions taken by the Office of Computer Science. We strongly believe, however, that even a perception of a conflict of interest seriously damages the Office's credibility, reduces the willingness of bureaus to accept constructive criticism and, consequently, increases the difficulty of advocating and implementing effective policy.

Similarly, we view the Office's procurement role as further hampering its policysetting and enforcement function. The former Director and current acting Director of the Office of Computer Science told us that they viewed their role of assisting in computer resource procurements as a means of enforcing policy within the Department. We were told that procurement requests would be delayed by the Office if Treasury policy was not followed. We do not believe that this is the best means to identify problems or impress upon the bureaus the importance of following established procedures.

Furthermore, because these roles are carried out simultaneously, we question whether the Office can make an objective decision on whether to emphasize expediting procurements or assuring Treasury policy is being followed. In fact, the Office of Computer Science has sometimes assisted bureaus in procurement efforts to the detriment of enforcing sound policy. For example, the Office was instrumental in assisting the Bureau of the Public Debt to prepare the necessary forms and documents required for a sole-source procurement of computer services. (See page 42.) Working with the Bureau, the Office concentrated on assuring that the procurement request would be approved and expedited by the General Services Administration. Although it was successful in this regard, our review of the feasibility study prepared under the Office's extensive guidance--as well as a similar review by Treasury's Inspector General staff--found that the procurement was questionable. Although the Office of Computer Science was able to help the Bureau of the Public Debt prepare a document that met General Services' specifications, GAO and Treasury's Inspector General found that the Bureau had failed to implement Departmental policy and procedures to clearly justify the proposed procurement. As another example, the acquisition of two computers by the Secret Service, when one was sufficient for its needs, represents a fundamental flaw in the Service's planning process. (See page 28.) However, the Office of Computer Science had reviewed and assisted the Service in the procurement.

THE PAPERWORK REDUCTION ACT CAN PROVIDE MORE EFFECTIVE CENTRALIZED MANAGEMENT FOR TREASURY'S COMPUTER RESOURCES

Many of the problems experienced by Treasury in attempting to provide effective Department-wide guidance and control of computer resources can be rectified if the Paperwork Reduction Act of 1980 is properly implemented. Although the act has several purposes affecting a wide range of information-related areas, it also contains specific provisions for improving the management of computer resources within Government agencies. In implementing the requirements of the act, the Department of the Treasury should take special care to avoid the kinds of problems that have hampered the Office of Computer Science.

The Paperwork Reduction Act of 1980: Its goals and objectives

The Congress has long had a deep concern over the type and amount of information collected by the Federal Government and how this information is used, disseminated, and protected once collected. Congressional intent has been to ease the burden on the general public of providing necessary information, ensure the Government utilizes the information in an optimal manner, and minimize the costs of using the information. This continuing concern has resulted in a wide range of legislation designed to reform and improve how information is collected and used by the Federal Government. The Congress' most recent effort in this regard was the passage on December 11, 1980, of Public Law 95-511: The Paperwork Reduction Act of 1980.

The act gives the Office of Management and Budget authority to oversee Federal agencies in a wide range of information-related areas, such as

--information collection requests;

--reduction of the paperwork burden;

--Federal statistical activities;

--privacy of records;

--interagency sharing of information; and

--acquisition and use of automatic data processing, telecommunications, and other technology for managing information resources.

The act also assigns specific responsibilities to each agency for carrying out all of its information management activities in an efficient, effective, and economical manner. One of these responsibilities is that each agency designate a senior official to report directly to the head of the agency.

This official is responsible for a number of information-related activities, including the management of computer resources. Among other things, the act requires the senior official to:

--Periodically review the information management activities of the agency, including planning, budgeting, organizing, directing, training, promoting, controlling, and other managerial activities involving the collection, use, and dissemination of information.

--Systematically inventory major information systems and ensure they do not overlap each other or duplicate the systems of other agencies.

--Conduct and be accountable for acquisitions of computer resources made pursuant to a delegation of procurement authority from the General Services Administration.

Our review was limited to automatic data processing operations in Treasury; therefore, we cannot comment on the other areas of information management that the act encompasses. In so far as computer-related information resources are conerned, however, we believe the act should significantly improve data processing management Treasury-wide. The accountability for computer-related activities assigned to the senior official will provide a better means of control over the Department's computer resources than the Office of Computer Science could. To ensure the senior official functions with maximum effectiveness in this regard, Treasury should avoid the problems that hampered the Office of Computer Science.

The Paperwork Reduction Act will require careful implementation by the Department of Treasury

The Paperwork Reduction Act requires that the designated senior official in Treasury have the responsibility of providing

Departmental guidance for computer resources that originally rested with the Office of Computer Science. At least one of the organizational obstacles faced by the Office in carrying out its responsibilities--limited access to the Secretary--has been rectified by the act. Although the Office of Computer Science was relatively low within the organizational hierarchy, the act specifies that the senior official will report directly to the Secretary. The act also offers significant potential for rectifying other impediments the Office of Computer Science had to contend with if the Department gives close attention to how its provisions are implemented.

Neither the act nor guidance from the Office of Management and Budget on how the act should be implemented specify what grade level the senior official should be. In our opinion, the amount of responsibility the official is assuming--especially in such a large and information-intensive department as Treasury--warrants a level that will reflect the importance of the task. As noted earlier, the Director of the Office of Computer Science was in the position of dealing with senior and high-level officials to evaluate, and often correct, data processing operations. Similarly there will be times when the senior official's views will conflict with those of Department and bureau top management. In order to make the official's authority, both real and perceived, commensurate with the responsibility that the position entails, we believe that the official needs a rank equivalent to other top administrators reporting to the Secretary. At a minimum, the official should have the same rank as that of an Assistant Secretary.

The senior official will also need adequate resources for the task at hand. Because of the problems previously discussed with the Office of Computer Science having limited staff, we believe that Treasury should study very carefully the resources required by the official to effectively monitor computer operations and ensure that this function is appropriately staffed.

Some of the positions that the official will require to oversee the Department's computer-related information resources can be obtained from the staff in the Office of Computer Science that previously carried out this function. To this end, we believe that the Department of the Treasury should take immediate steps to limit that Office's function to the operation of the Department's computer center and transfer its policysetting and monitoring roles to the designated senior official. This will avoid any duplication of effort, ensure that the official has total and direct control over the monitoring of computer activities, and rectify the problem of conflicting roles that had been assigned to the Office of Computer Science.

To prevent similar conflicts in the future, we believe that it is important that Treasury limit the senior official's duties duties to those necessary to meet the requirements of the act. Relieving the official of program responsibilities is especially crucial considering the broad range of other information activities besides computers that the individual is also responsible for under the act. These activities will encompass virtually all of the Department's operations so that the possibility of perceptions of selective or self-serving enforcement is increased even more. Moreover, just the size of the task confronting the individual should be reason enough for limiting the official's duties and responsibilities. As a final reason, however, establishing the senior official in a staff function removed from program objectives would, in our opinion, impress upon Department and bureau management the critical importance of the position.

The concepts embodied in the Paperwork Reduction Act should be implemented in each Treasury bureau

By designating a senior official who reports directly to the head of an agency, the act intended to establish an identifiable line of accountability for information management activities, provide for greater coordination among the agency's information activities, and ensure greater visibility of such activities within the agency. These are goals worthwhile for Treasury's bureaus as well. The problems that have been identified with data processing activities by this review and by internal evaluations demonstrate that, at least in the area of computer resource management, the Department's bureaus have a definite need for the improvements the "senior official" concept should effect. Although we cannot specifically address the potential for improvements at the bureau level in all the information activities covered by the act, we believe that the number, size, and diverse nature of the Department's information activities justify the creation of similar positions within the bureaus in order to help Treasury's senior official accomplish all that is required by the act.

In our opinion, the designation of a single individual within each Treasury bureau to be responsible for overseeing information activities can provide the same improvements in managing computer resources at the bureau level as the designation of Treasury's senior official will at the Departmental level. The establishment of a centralized focal point reporting directly to the bureau head would greatly improve the control, visibility, guidance, accountability, and coordination of all information resources, including those that are computer related. We believe that the problems with data processing operations in Treasury bureaus that are discussed throughout this report are evidence of the need for implementing such improvements at the bureau as well as the Department level.

The magnitude of the responsibilities and duties that are faced by Treasury's senior official in fulfilling all of the requirements of the Paperwork Reduction Act is tremendous. Overseeing the wide range of information activities of any single Treasury bureau--the Internal Revenue Service or the Customs Service for example--would be difficult enough. Overseeing all of Treasury's bureaus, especially those that are extremely information-intensive because of their enforcement and regulatory functions, will require a formidable effort.

The Congress, in fact, has already recognized the difficulties of implementing the Paperwork Reduction Act in the larger departments. In the House report that accompanied the act, it was noted that:

> "The appropriate structure [for implementing the act's requirements] is somewhat different in the case of a Government department having constituent agencies, such as the Department of Defense. The Committee expects that each constituent agency will establish a central information management unit, subject to the review and approval of the department-level unit headed by the designated senior official. The basic reason for this organization is that a department has the responsibility to consider its mission in a department-wide sense, whereas a constituent agency will generally consider only its own mission. In some cases, an individual action may raise a conflict between a constituent agency and its department. Consistent with the objectives of this legislation and within statutory limits, the constituent agency must conform its needs and interests to those of the department."

We believe that the situation at the Department of the Treasury is analogous to that described in the House report.

In order to provide Treasury's senior official a means of fulfilling the requirements of the Paperwork Reduction Act, as well as avoid the problems cited in the House report, we envision the following type of organization within the Department. Each Treasury bureau--or other organizational entity if its size warrants it--should have an individual named to serve as a counterpart for the Department's senior official. These individuals would serve the head of the bureaus in the same fashion as the senior official serves the Secretary of Treasury by providing a centralized focal point for coordinating and administering information resources. Each would head a staff, or central management unit, sufficient in size for the requirements of the position and have duties and responsibilities that parallel the senior official's but limited to the bureau. Consequently, we believe that, just as with the senior official, it is important that the individual have the authority and independence required to function effectively.

Although reporting directly to the head of the bureau, the individual would function under guidelines established by Treasury's senior official and be primarily responsible for ensuring that the senior official's policies and directives are fully implemented within the bureau. This would allow the official to establish a communication network and systematic operating procedures across the Department and within the bureaus that would facilitate the reporting and coordination efforts that will be required for effective implementation of the act.

THE ASSISTANT SECRETARY FOR ADMINISTRATION IS NOT AN APPROPRIATE CHOICE FOR TREASURY'S SENIOR OFFICIAL

On August 18, 1981, while we were preparing this report, Treasury's Assistant Secretary for Administration was designated as the Department's senior official under the provisions of the Paperwork Reduction Act of 1980. We were told, however, the designation was on an interim basis and that the Assistant Secretary's additional duties have yet to be specifically determined. On the basis of the concerns and issues we have raised in the preceding pages, we do not believe this is an appropriate choice.

The Assistant Secretary for Administration serves an important function in the Department of the Treasury. The responsibilities of this office--excluding whatever additional ones are imposed by the Paperwork Reduction Act--include overseeing the Department's personnel and training programs, its financial and information management systems, as well as its procurement and contracting functions. As discussed earlier, we believe that in order to avoid any possible conflicts of interests, assure the act's provisions are effectively implemented, and impress upon Treasury management the importance of the position it is vitally important that the senior official's duties be limited to those necessary to meet the requirements of the act.

As previously discussed, the Assistant Secretary for Administration also has purview over the Office of Computer Science. In fact, for some time, Treasury Directives have delegated a number of generalized responsibilities in the area of Department-wide computer resource management to the Assistant Secretary for Administration. Many of these responsibilities, in turn, have been delegated to the Office of Computer Science. If many of the Assistant Secretary's responsibilities for computer resources as senior official are delegated to the Office of Computer Science, the Department will continue to face the same difficulties discussed earlier in this chapter.

CONCLUSIONS

The Secretary of the Treasury has lacked an effective means of providing centralized direction and control over computer resources within the Department. The Secretary's designated focal point for these activities, the Office of Computer Science, has made a number of efforts to establish Department-wide policies and procedures that could have improved the management of computer resources within Treasury's bureaus; however, it has been hampered by limited resources, conflicting roles and objectives, and being placed too low within the organization. As a result, the management of computer resources within Treasury bureaus has not received the emphasis or coordination from the Departmental level necessary to ensure optimal effectiveness and efficiency. Many, if not all, of the problems with planning and controlling computer resources in Treasury bureaus that are discussed in this report could have been prevented or substantially alleviated had a stronger, more effective oversight mechanism been in place in the Office of the Secretary.

Congressional concern over a similar lack of top management oversight of information resources in other Government agencies has resulted in the recent passage of the Paperwork Reduction Act of 1980. This act, particularly its provision for designating a senior official to report directly to the head of the agency and be responsible for carrying out the act within the agency, can make a substantial improvement in the management of computers and other information-related activities if properly implemented. The Department of the Treasury should ensure that the problems encountered in the past by the Office of Computer Science do not recur and that the act has a maximum impact at the bureau level as well.

In order for the Paperwork Reduction Act of 1980 to have a meaningful effect on improving the management of computer resources within the Department of the Treasury, it is important that the act be implemented conscientiously and with careful consideration given to the size and extent of computer operations within the Department. The designated senior official required by the act will have a significant impact on how well the act is carried out and, consequently, on the act's achievements. For optimal effectiveness, it is critical that the official have adequate authority and resources to implement the act's provisions and that the official not have an operational or program management role that conflicts with the oversight and evaluation role required by the act.

RECOMMENDATIONS

We recommend that the Secretary of the Treasury:

--Limit the senior official's duties and responsibilities to those required by the Paperwork Reduction Act to assure the official can devote sufficient time and attention to enforcing the act, assure the independence and objectivity of the official, and impress upon Department and bureau management the critical importance of the position.

--Provide the senior official with sufficient rank to demonstrate the importance of the position and to facilitate the implementation of policies and procedures that are issued by the official. At a minimum, the official should be of Assistant Secretary or equivalent rank so that it is clear to all levels of management that the official is the direct representative of the Secretary in all matters regarding information management.

--Assure that the senior official has adequate staff resources to meet the responsibilities imposed by the act.

--Have each bureau, and other offices where appropriate, name an individual to report directly to the bureau head and assist the senior official in implementing the requirements of the Paperwork Reduction Act within the bureau. These individuals should have the authority and staff necessary for implementing the policies and procedures established by the senior official.

AGENCY COMMENTS AND OUR EVALUATION

In a letter dated November 30, 1981, the Assistant Secretary for Administration presented the Department's position on our recommendations (see appendix). She generally agreed that Departmental oversight of computer resources should be strengthened. We were informed that additional studies have recently been initiated to improve planning and provide a more coordinated process for reviewing the acquisition and utilization of computer resources. The Assistant Secretary also agreed that the senior official required by the Paperwork Reduction Act of 1980 should have sufficient rank to demonstrate the importance of the position as well as adequate resources to carry out that official's duties.

The Assistant Secretary disagreed, however, with our finding that the Assistant Secretary for Administration was an inappropriate choice for the senior official and with our recommendation that the duties and responsibilities of the senior official be limited to those required by the act. She also disagreed with our recommendation that an individual be designated in each bureau to serve as the senior official's counterpart. The Assistant Secretary stated that carrying out our recommendations would result in the creation of a new Assistant Secretary for computer management as well as similar positions in each bureau within the Department. In her opinion, this approach attempts to solve organizational problems by increasing the number of top-level offices, does not consider the additional cost of establishing these new offices, would isolate computer management from other information-related functions, and is not justified since computer resources management is adequate under current arrangements.

We are not advocating the creation of a high-level Departmental office limited to computer management. Rather, our recommendations deal with how to best implement the Paperwork Reduction Act which requires Federal agencies to designate a senior official to report directly to the agency head and to be responsible for, among other things, the effective management of computer resources. Given this requirement, and considering the act's potential for improving other areas of information management, our position as discussed on pages 10 and 11 is that the Department should give careful consideration as to what resources the official will require in order to effectively carry out all of the act's requirements. We believe most, if not all, of the staff required to support the senior official's needs is already available within different organizations throughout Treasury. In some cases, these individuals are already performing duties that are now under the purview of the senior official. For example, as we discussed on page 11, staff to assist the official in overseeing the Department's computer resources is already available in the Office of Computer Science. Similarly, the official could draw on technical expertise from the bureaus on a temporary basis to assist in special projects as the Office of Computer Science currently does.

The senior official will be responsible for an extensive amount of information-related activities. These additional responsibilities consolidate, rather than isolate, computer management with other information-related functions. They also make it even more imperative that the official have adequate resources and authority and that the possibility of conflicting roles and responsibilities be eliminated. The potential of the position for improving all information-related activities is simply too great to justify designating it as an additional duty.

We disagree that computer resource management was adequate under the Office of Computer Science. As discussed on pages 6 to 9, it lacked sufficient resources, was too low within the organizational hierarchy, and had conflicting responsibilities. The potential improvements that the Office could have effected--for example, the Department's handbook for managing computer operations and facility reviews--were not fully implemented. As discussed on pages 6 and 7, the handbook's requirements were not being enforced and only three reviews had been conducted since 1973. In any event, the Paperwork Reduction Act clearly requires that Treasury, as well as other Federal agencies, increase the emphasis on managing information resources. We continue to believe Treasury should ensure that the senior official does not face the difficulties the Office of Computer Science did in overseeing the Department's computer operations. Giving the Assistant Secretary for Administration the added responsibility for acting as senior official under the act and continuing to delegate this responsibility to the Office of Computer Science constitutes a business-as-usual approach which can only help to perpetuate the conditions described in this report.

The Assistant Secretary's objection to our recommendation that the senior official have a counterpart in each bureau is that the small size of computer operations in some bureaus does not warrant it being placed under a separate, high-level bureau official. This is not what we are recommending.

Our report does not attempt to address the question of where and at what level computer operations should be located within an organization. Similarly, we are not recommending that the senior official's counterparts in the bureaus be responsible for managing computer operations. Rather, our recommendation calls for an individual with appropriate resources to assist the bureau head as well as the Department's senior official in providing policy oversight over all information-related activities, including computer operations.

Although the size of the Department's bureaus varies considerably, all are affected by the Paperwork Reduction Act. Each collects, processes, and disseminates information. Consequently, we do not believe that the size of a bureau should be a consideration in deciding whether an individual should be designated to assist the Department's senior official to implement the requirements of the act. However, we do believe that the size of a bureau's information-related activities should be considered when determining what authority, resources, and independence the individual will require to function most effectively. Bureaus that are extremely information-intensive, such as IRS and the Customs Service, will require an individual of recognized authority and an adequate support staff. Similarly, the larger the bureau, the more important it is that the individual not have ongoing program responsibilities that might conflict with the regulatory functions of the position. In smaller bureaus, however, the position could be assumed as an additional duty.

Treasury is an extremely large organization consisting of a large number of organizational components with a diversity of goals and objectives. In implementing the Paperwork Reduction Act of 1980, the Department will have to give careful consideration to a number of factors. Recognizing this, the Department has recently formed a task force under the Assistant Secretary for Administration to study how the act can be implemented for maximum benefits. We strongly support this effort and we believe our recommendations should serve as a general framework for the task force in developing a more specific implementation plan.

CHAPTER 3

TREASURY BUREAUS NEED BETTER LONG-RANGE PLANNING TO RELATE MISSION NEEDS WITH COMPUTER RESOURCES

Computer resources in many Treasury bureaus either exceed or else fall short of the requirements of the programs and activities they are intended to support. This disparity is caused by the lack of a coordinated approach for the timely assessment of computer resource needs and the orderly acquisition of the machines, people, and services to meet these needs. The results have been unnecessary costs, questionable procurements, excess computer capacity, and unmet user needs.

To assure that all of an organization's data processing needs are considered, top management, user management, and data processing management should be actively involved in identifying these requirements. This process is facilitated by a permanently chartered steering committee to assist the organization's head to review and approve plans, allocate scarce resources among user groups, and assign priorities to requests for computer support. Although many Treasury bureaus have parts of a strategy formulation mechanism similar to a steering committee in place, most lack a complete system of integrating program goals with data processing requirements despite numerous recommendations from previous internal and external reviews.

A COORDINATED APPROACH TO PLANNING FOR COMPUTER RESOURCES

Forecasting data processing requirements and planning for the total range of resources to meet these requirements are among the most important functions of a steering committee. To effectively carry out this role, the committee should have a formalized process to periodically and routinely assess data processing requirements and consolidate them subject to the limitations of the agency as a whole and the review and approval of the agency's head. Accurate and complete cost data is a prerequisite for informed decisionmaking by the committee in this process.

Computer technology planning requires an agencywide perspective

Computer technology, as a management tool used throughout an organization, must be assessed within a framework that considers the total level of resources available, each user's share of these resources, and how users' needs can be met in the most effective and efficient manner. To accomplish these functions, the steering committee should have procedures in place to integrate resource needs with the agency's budget function by means of a long-range planning system.

The basic objective of a long-range planning system is to recognize and define an organization's data processing requirements sufficiently in advance to allow for the orderly acquisition or enhancement of computer resources. Any growth of these resources should be closely linked with that of the agency's missions and programs to assure consistency and avoid insufficient or excess computer capacity. Consequently, the active involvement and direct participation of the steering committee in formulating plans is essential. To assure the steering committee has adequate control over the planning function, a long-range planning system should incorporate the following features.

A central planning group should be established at the same level as other top agency planners and should include representatives from each major user as well as from the data processing unit. The functions of this group should include the preparation of an agencywide, integrated, long-range computer technology plan from the requirements submitted by functional groups. The group should also be responsible for identifying and assessing the overall risks and benefits of potential payoffs of these proposed requirements on the basis of well-documented feasibility studies and cost/benefit analyses.

The planning document produced by the central planning group should be based on a time frame consistent with that of the agency programs requiring data processing support. At a minimum, the plan should cover a 5-year period. It should also have provisions for updating on a yearly basis or more frequently if the need arises. Additionally, the plan should be in a narrative as well as budgetary format to explain and quantify requirements and contain sufficient information to identify

--the long-range objectives and sub-objectives of the computer support to be provided,

--the assumptions used in deriving the plan,

--officials and groups at various levels within the organization responsible for carrying out the plan, and

--milestones for measuring the progress of achieving the plan.

The role of the steering committee in planning for computer resources is to consolidate and integrate both the technical and functional aspects of data processing. Under the direction of the agency head, and with all decisions subject to his or her approval, the committee should be responsible for

--reviewing and approving the long-range plan produced by the central planning group,

--allocating the organization's computer resources among user groups,

--assigning priorities to proposed management information systems, and

--reviewing and approving proposed computer procurements.

To facilitate the commitee's decisionmaking process, we believe that it is important that the committee be chaired by the head of the agency or, at a minimum, his or her deputy. Committee actions are certain to have significant and far-reaching effects on the entire agency. Furthermore, decisions are not likely to be easily reached. The budgeting and allocating of computer resources among competing user groups is likely to engender considerable deliberation. The active involvement and direct participation of the agency head or deputy in the committee's proceedings can expedite this process by ensuring that the committee's efforts are directed by someone with an agencywide perspective with clearly recognized authority that crosses organizational lines.

For additional assistance, the steering committee should have a support staff responsible for shaping and formulating questions and issues for committee resolution. Depending upon the size of an organization's data processing operations, this function could be accomplished as one of the duties of the central planning group.

Cost accounting for computer resources and services is essential for the steering committee to function properly

In order for the steering committee to have an accurate basis for informed decisionmaking, the total costs of developing and operating data processing services must be accounted for. Once the total costs are known, it is equally important that an accounting system be in place to measure costs by user and by specific application.

For some time, GAO has urged that Government agencies develop computer cost accounting systems so that management can

--assess the full cost of requests for computer services, including the resources required to operate information systems as well as design them;

--evaluate the relative worth of current and proposed applications on the basis of their total cost and their benefit to the organization's missions and programs;

--make informed investment decisions as to whether systems should be designed and operated in-house or by outside sources;

--measure the effectiveness, and also the efficiency, of data processing services;

--determine the allocation of support needed to meet new and existing program needs; and

--foster cost consciousness among data processing users.

More recently, the Office of Management and Budget has directed Federal agencies to account for the full cost of operating data processing facilities and to allocate all costs to users according to the service they receive. Circular No. A-121 of September 16, 1980, will make a substantial improvement in managing computer resources Government-wide when it is fully implemented. During our review, we noted several Treasury bureaus that were developing, or were considering developing, computer cost accounting systems even before being required to do so by the Office of Management and Budget. Most of these systems, however, were far from actual implementation, and substantial efforts will be required before Circular No. A-121 is fully implemented within Treasury. In view of the importance of accurate cost data to steering committees in allocating resources and controlling expenditures, we believe Treasury's senior official should give renewed emphasis towards having computer cost accounting systems operational in Treasury's bureaus as soon as possible.

PLANNING FOR COMPUTER RESOURCES IS STILL A PROBLEM IN TREASURY'S BUREAUS

Several Treasury bureaus have recognized the necessity of a steering committee to formulate a long-range growth strategy for computer resources and have taken steps to implement such a system. Others have only partially initiated a planning system, if at all, despite previous recommendations from internal audits and management reviews. As a result, computer technology is still not contributing as much as it could in helping Treasury bureaus achieve their missions and objectives.

Inadequate long-range planning for requirements has affected many of Treasury's computer operations. The effective and economical procurement of computer resources--hardware, software, facilities, personnel--has been difficult because of the lack of a well-conceived assessment of requirements and a sound strategy for the orderly acquisition of the means to meet these needs. Failure to fully recognize and adequately define data processing requirements has resulted in obsolete equipment that is difficult to maintain, computers with saturated capacity, and the acquisition of equipment that was not needed.

Equipment is not the only computer resource affected by faulty planning. Uncoordinated planning that did not consider the bureaus' total needs has resulted in fragmented, duplicative information systems whose cost to develop and run are unnecessarily high. Similarly, without adequate planning, other resources necessary to support computer operations, such as personnel to run equipment and enter data, have not been provided for.

The Bureau of Engraving and Printing is not using computer technology as much as it needs to

Actions taken by the Bureau of Engraving and Printing to improve management guidance and commitment in acquiring much-needed support from computer technology are a step in the right direction. However, automation needs that would greatly assist production are still unmet.

Since 1972, various internal and external studies at the Bureau have identified the necessity for long-range planning to satisfy computer technology requirements. Because planning efforts were uncoordinated and failed to adequately consider the total impact Bureau-wide, many of the proposed information systems were abandoned after being partially or even fully developed. Other systems were abandoned or significantly delayed after substantial development efforts when problems occurred attempting to integrate them with other systems. A steering committee that had been formed in 1976 was discontinued after its first and only meeting and was not reinstated until October 1979.

Even with the current committee, however, problems persist and information needs identified several years ago have yet to be met. For example:

--Work was started in May 1976 on a Manufacturing Information Resource System after manual data collection had become increasingly strained by more complex equipment and processing techniques. In June 1977, the system's project committee had completed an initial review of the information collection and reporting systems that were currently in operation and proposed a replacement consisting of nine related subsystems. With the steering committee inactive, however, support for the project waned and little more was accomplished. In January 1978, the project was abandoned after a project plan had been completed outlining the nine manufacturing subsystems. The cost of the project was an estimated $120,000. At the completion of our review, the steering committee had not yet reconsidered the need for the system. According to a 1979 Treasury report, the Bureau has had to develop an ever-more-massive set of manually kept logs, forms, records, and reports.

--In 1974, the Bureau installed an automated Press Activity Reporting System to collect and analyze productivity data for its printing presses and provide more accurate cost information. The overall benefits were immediate. After almost a year of operation, however, the system experienced software and equipment problems which caused frequent system downtime and distortion and destruction of data. In January 1976, it was reported that in order to revitalize the system it would be necessary to completely overhaul the design and programming of the system, including redesigning data entry procedures. The Bureau, however, lacked the necessary skilled staff and other resources to accomplish these tasks. At the completion of our review, the system had yet to be updated and Engraving and Printing was still burdened with manually intensive reports of production data.

--The Bureau began using Treasury's Department-wide payroll system in September 1978 but did not acquire all of the equipment and implement the procedures necessary for full conversion until August 1980. As a result, employee payroll information, to a large extent, had to be manually collected, edited, and verified, and many of the benefits of full automation were not realized as soon as they could have been.

--The Product Code Scheduling System dates back to 1975 when the need for automating the file of product codes was initially recognized. By 1978, a design effort was started but was abandoned shortly thereafter. Efforts resumed in April 1979 but once again stopped after a few months. Although the requesting unit maintains that a need for the system still exists, we were told that user personnel were not available to assist in its development.

--Development of two other systems to measure the monthly cost of currency and operations was delayed after substantial work had already been completed because of unexpected problems with integrating them with other information systems. Another system for managing fixed assets has been indefinitely postponed for the same reason.

The use of computer technology at the Customs Service lacks direction

The problems resulting from the lack of planning for automation needs at Customs have been pointed out to the Service many times in the past in studies that have continually stressed the need for top management and user involvement. Some of these problems are especially visible with Customs' Treasury Enforcement Communications System. Use and dependence on the system have grown tremendously but without adequate planning for who would be using it, for what purpose, and what resources would be necessary to support it. As a result, the system is programmed in a nonstandard language, there is a backlog of projects not being systematically approached, and necessary information is not entered into the system.

Customs inspectors use the system to inquire whether persons, vehicles, ships, or planes entering the country are suspected of violating customs laws or have been involved in past smuggling attempts. Accessible by over 1,000 terminals at official points-of-entry, the system is run on its own computer at a facility in San Diego, California. Over 50 system applications provide online inquiry capabilities and also produce various management information reports. In addition to Customs, the system is used by the Coast Guard; the Bureau of Alcohol, Tobacco and Firearms; IRS; the Drug Enforcement Administration; the State Department; and INTERPOL. The Service considers the system to be crucial for enforcing the country's customs laws.

The system's growth, as has already been pointed out to Customs by numerous sources, has been without any strategic consideration given to how the system would eventually be used. It began in 1970 at a single border crossing with 18 terminals connected to a nearby computer. Its purpose was to replace the handwritten lists inspectors carried in their hats to identify vehicles suspected of smuggling. By 1973, over 500 terminals were in the system. As the value of the system became apparent, more and more uses--as well as users--were added. Each addition, however, was piecemeal without Customs ever assessing the system's growth potential or developing a long-range plan for its orderly development. As a result, the system is neither as effective nor as efficient as it could be. For example:

--Because there was never a comprehensive plan for the system's growth, it was programmed in a language that can only be run on one manufacturer's computer. Thus, competitive procurements are not possible, and Customs cannot be certain it is using the most economical equipment to run the system on. The cost of reprogramming the system has been estimated by one Customs official at $3 million.

--Because the Service does not firmly establish the priority of requests for modifications, special runs, or new applications to be run on the system, there is a backlog of requests which is not being systematically approached. Changing priorities and rescinding previously made decisions disrupts scheduled operations and require constant reassignment of personnel from one incomplete project to another.

--Because Customs has not adequately planned for the staff resources required to input certain data into the system, several applications have been suspended and others have lost much of their effectiveness since data is not being entered into the system in a timely manner. Over 40 additional staff would be required to assure that all the necessary data is put into the system promptly.

The Bureau of Government Financial Operations has not expanded computer capability to meet its increasing workload

The failure of the Bureau of Government Financial Operations to assess the long-term implications of its dependence on computer technology on a timely basis has resulted in increased costs of operations, unmet requirements, and has seriously jeopardized the accomplishment of the Bureau's primary mission.

Government Financial Operations provides check disbursing and reconciliation services for civilian agencies in the Federal Government. Supporting this huge operation are 28 general purpose computer systems in 8 disbursing centers located across the country. The average age of the Bureau's computers is 14 years. Almost half are over 17 years old. According to the Bureau, the age and obsolesence of the equipment, lost maintenance support from manufacturers, and the mix of different equipment at disbursing centers have created a situation of crisis proportions. Although the Bureau currently is in the process of replacing its equipment, the procurement, expected to cost approximately $55 million, has taken several years and the new computers are not expected to be operational until late 1982. In the meantime, the Bureau continues to operate equipment that it says should have been replaced long ago. In addition to the danger of the collapse of the check disbursing system, the outdated computers prohibit the Bureau from employing complete automation and are causing excessive costs. For example, according to a study prepared by the Bureau:

--Even though the same systems are used at almost all of the disbursing centers, substantial modifications are required to ensure that they will operate on each center's computer. Additionally, the Bureau has been unable to implement several cost saving improvements because more efficient systems cannot be run on the current equipment.

--Several functions are now being carried out by hand, at greater cost, because the computer systems are so saturated they will not support additional applications. Moreover, operating at a saturation level causes critical problems in scheduling workload. On several occasions, in order to meet payment schedules, work had to be transferred to other disbursing centers because of unexpected computer downtime.

--The Bureau's check disbursing system inputs about $10 billion a month into the nation's economy. Because of the age of the equipment, several disbursing centers have come seriously close on several occasions to missing deadlines for issuing checks even when work had been transferred. Furthermore, the frequency of these occurences is increasing. Missed deadlines or extended computer downtime at one or more disbursing centers would quickly compound problems at the others which lack any reserve capacity to handle the overload. Consequently, all of the checks issued by the Bureau could be delayed causing serious problems for individuals as well as the economy.

The Secret Service has excess computer resources

The lack of a coordinated approach for assessing long-range computer technology requirements resulted in the Secret Service acquiring more computer equipment than it needs. Because data processing requirements were not adequately identified, the Service began using duplicate computers and has subsequently replaced them twice.

During our review, we reported to the Director of the Secret Service that the Service was using two high-performance computers when one would be sufficient. 1/ The Service justifies the use of duplicate computers by citing the need for rapid access to and enhanced security and backup capability for its protective system. However, as our report pointed out, these needs had not been adequately considered or quantified before the Service began using two computers, nor was the necessity of duplicate computers ever justified when the computers were replaced.

Tests we performed showed that the Service was not realizing any advantages or improvements in accomplishing its mission because it had two computers rather than one. The total cost

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1/"The Secret Service Has More Computer Capacity Than It Needs" (GGD-81-43, March 17, 1981).

of both computers is expected to reach $3.5 million over their 6-year lifespan. As we reported to the Service, a significant amount of these costs, perhaps as much as half, could have been avoided if the Service had adequately defined its computer resource requirements.

Other Treasury bureaus have also made limited progress in computer resource planning

The planning inadequacies cited by the President's Reorganization Project in chapter 1 are evident in many of the Treasury bureaus we reviewed. For example, the Bureau of Alcohol, Tobacco and Firearms instituted a steering committee in 1974 but the committee stopped functioning soon afterwards. Three subsequent internal studies noted the need for a steering committee to act as a focal point for planning, prioritizing, and controlling the use of computer technology. Finally, in March 1981, the Bureau again established a steering committee. Membership, however, is composed of representatives of senior management officials rather than the officials themselves.

Similarly, the Office of the Comptroller of the Currency has had a steering committee since 1975 after it had been recommended by a consulting firm. Not until May 1979, as the result of another internal review, was the committee's charter expanded to include evaluating and approving individual information systems. However, despite the review's recommendation that the committee emphasize long-range planning, the revised charter is still somewhat lacking in this regard. The plan is for a 2-year period, prepared by the data processing group and then reviewed and approved by the committee.

CONCLUSIONS

Many Treasury bureaus have not established a formalized, coordinated system for forecasting data processing needs sufficiently in advance to allow for the orderly acquisition of computer resources to satisfy these requirements. The absence of top management and user involvement and participation in formulating long-range computer growth strategy has resulted in Treasury bureaus having too much or not enough computer capacity, excessive costs of operations, and unmet user needs. In short, computers are not being used to support the missions and objectives of Treasury's bureaus as effectively and efficiently as possible.

RECOMMENDATIONS

We recommend that the Secretary of the Treasury direct the designated senior official to ensure that each of the Department's bureaus establish computer resource steering committees consisting of user and data processing management, and chaired by the bureau head or deputy, and charge these committees with responsibility for assessing computer resource needs on a periodic basis and formulating an effective growth strategy. Each committee's planning process should incorporate the features developed in this chapter. In order to allow the steering committees to function properly in allocating computer resources and evaluating proposals, we also recommend that the senior official require that the development and installation of computer resource accounting systems be expedited in Treasury's bureaus.

AGENCY COMMENTS AND OUR EVALUATION

In her comments (see appendix), the Assistant Secretary for Administration agreed that there were problems with long-range planning for computer resources at the bureaus and stated that the Department will take the necessary steps to meet our recommendations. She also said that the Department is in the process of developing a unified approach to information management activities in accordance with the Paperwork Reduction Act of 1980 and that planning requirements for computer management would be significantly changed as a result. The Assistant Secretary also agreed that proper cost accounting for computer resources is essential to assure their effective utilization. She informed us that the Department will take a more aggressive role in having cost accounting systems fully implemented in all bureaus.

The Assistant Secretary noted, however, that Treasury's handbook for computer management provides a framework for a coordinated approach to computer managment and that, under it, every bureau prepares 5-year plans for the allocation of computer resources. She also stated that the Department had found the utility of long-range plans to be limited because of the uncertainties inherent in the Government budgetary process. She pointed out that plans are most useful as guideposts for incremental decisions rather than as precise blueprints for future action.

In our opinion, the Department's handbook provides a framework only for preparation of the documents required for long-range planning. It prescribes the contents of the bureau's plans to include an executive summary of current and planned computer activities, an inventory of computer applications and hardware, financial and personnel acquisition plans, and other material required by the Office of Management and Budget and the General Services Administration for the annual budget cycle. The handbook also describes the documentation to be prepared and the applicable Government-wide policies for updating the long-range plan. To this extent, the handbook is good. What the bureaus also need, however, is a planning process that provides the active involvement and direct participation of top management and users so that they can respond to budget limitations and other uncertainties.

The planning process we have described on pages 20 to 22 is one that emphasizes the importance of establishing an overall strategy for identifying how computer resources will be acquired and used to support the bureaus' missions. Similarly, we have pointed out the need for a long-range plan to reflect changing conditions. We believe that the formulation of an orderly growth strategy by the active involvement of key bureau officials in the ways we describe offers an opportunity to significantly improve the Department's long-range planning process.

The Assistant Secretary also stated that a steering committee approach is not appropriate for every Treasury bureau. She stated that we have emphasized specific procedures and have not taken into account the different sizes and missions of the Department's bureaus. We disagree. This report provides only a general approach and has discussed only the basic features of a long-range computer resources planning system. Before such a system can be effectively implemented, it will have to be carefully tailored to the circumstances of each particular bureau. Although we have provided only a framework for the Department's senior official to use in making improvements, steering committees are an integral part of this framework.

Although she did not take exception with any of the problems we found with Customs' Treasury Enforcement Communications System, the Assistant Secretary stated that we did not fully consider the improvements that have been made in other areas of data processing at the Service. We recognize that these improvements--most notably a reorganization of three computer activities into a single organizational entity--have produced significant accomplishments. Furthermore, our discussions with Customs' officals have encouraged us to believe that the Service will continue to take aggressive actions for improvements elsewhere, including its enforcement systems.

Regarding the Bureau of Government Financial Operations, the Assistant Secretary agreed that more needs to be done to improve the Bureau's planning process. She pointed out, as we mentioned on page 27, that the recent acquisition of computers will ensure sufficient capacity once they are operational. We note, however, that our purpose in discussing the limitations of the Bureau's data processing capabilities was not to point out the need for updating its equipment. Rather, our purpose was to demonstrate the effects of not updating equipment earlier. In our opinion, the Bureau could have avoided many of the problems it now faces with proper planning.

Although she informed us that the Department will take the necessary steps to meet our recommendation to improve planning and noted that some steps are already being taken in this regard, it was unclear from the Assistant Secretary's comments as to what will be done specifically. We believe that until our recommendations have been implemented, the basic cause of the problems we have described will remain unaffected. Consequently, the Department's improvements should be made within the framework our recommendations provide.

CHAPTER 4

INADEQUATE CONTROL OVER THE DEVELOPMENT OF INFORMATION SYSTEMS REDUCES THEIR USEFULNESS AND INCREASES THEIR COST

Perhaps the most valuable of Treasury's computer resources--in terms of usefulness as well as cost--are the information systems themselves. Computerized systems that collect, process, and distribute large volumes of data are tremendously complex in nature and require a significant amount of time and effort to design, install, and maintain. Too often, those responsible for developing the system do not receive the proper guidance and direction from those who will ultimately use it or those who have approved it.

Unless top management and users are actively and continually involved in the development of an information system, the results are unlikely to meet expectations or requirements. An executive steering committee, responsible for reviewing and approving proposed systems and monitoring the progress of those being developed, is an invaluable means of providing such involvement. If properly implemented and given sufficient authority, a steering committee assures that the agency's overall information needs are considered and provides user control over the development process while assigning accountability for the results. Effective system development procedures--standardized and formalized to ensure they are consistently used--are a key mechanism for the committee to function properly. They provide a structured and cooperative approach for users and those developing the system that assures specific agreement as to what is needed and what can be provided. They also allow the committee to monitor and evaluate the progress of information systems at appropriate stages in their development.

Inadequate control over systems development by top management and users is a serious problem at many of Treasury's bureaus. The results have been information systems that are not cost-effective, do not meet user needs, experience prolonged development cycles and cost overruns, or simply do not work. Greater management attention and emphasis are needed to assure the systematic and timely development of information systems that will meet users' needs as well as those of the bureau as a whole.

TOP MANAGEMENT AND USERS SHOULD HAVE A FORMALIZED ROLE IN DEVELOPING INFORMATION SYSTEMS

Once an effective long-range planning system has been instituted, management must assure that plans are properly carried out. Individual projects approved by the steering committee need careful monitoring throughout the design and development stage to ensure that information systems are implemented in a timely manner, at a minimum cost, and are responsive to users' needs. For maximum effectiveness, information systems should be designed within a framework of procedures that specify and define the duties and responsibilities of three separate groups: those who develop the system, those who will be the primary users, and senior management officials of the entire organization.

Steering committee involvement during systems development is crucial

The role of the steering committee in systems development is

--ensuring a logical, systematic approach for systems design efforts that specifies the responsibilities of those who requested the systems and those responsible for designing them; and

--assessing the development of information systems by monitoring and evaluating development progress.

Standardized and formalized system development procedures, detailing the results to be achieved, and by whom, at various steps from project proposal through system implementation, provide management a means of reviewing progress throughout the development cycle. They also assure that all information systems are developed consistently and that key activities are properly completed.

An orderly approach to systems development is essential

The development of an information system encompasses numerous tasks and multiple phases which are characterized by the type of work performed and the end products produced. A widely used and proven approach in systems development is to divide the overall work into a logical and systematic sequence of manageable phases, such as

--problem adequately defined,

--user requirements clearly defined,

--feasibility and cost-benefit studies made,

--functional specifications finalized,

--design specifications approved,

--programming accomplished,

--design and operational testing completed, and

--user/operator manuals and training provided.

A standard product-oriented approach, with well-defined phases, provides management with an effective mechanism for controlling projects. It includes appropriate review points enabling management to continuously monitor and assess the project's progress and performance and, where necessary, reevaluate, reschedule, or even terminate development work. It assures mutual understanding and agreement between users and developers regarding the scope and definition of the system, what has to be done, and what is to be achieved before proceeding to the more technical steps of actually implementing the system. Each phase should be fully completed, reviewed, and approved by appropriate managers before the next phase is begun.

Project managers increase users' control over development efforts

Each major information system should have a full-time project manager assigned as a central point of authority to provide day-to-day direction, coordination, and control for the development effort. Generally, the project manager should be a user representative and have a formal charter of authority defining his or her specific duties and responsibilities. The project manager should be given full authority to make decisions on allocating personnel resources; establishing plans, schedules, and budgets; and conducting most technical activities. He or she should be responsible for coordinating the various interrelated functions involved in system development and providing direction and leadership for the project team.

A project manager is the key person in negotiating tradeoffs during the course of a project and arranging meetings with the steering committee to keep them informed of project status, obtain required approvals, and refer problems outside his or her authority. Such matters usually relate to conflicting priorities, resource requirements not being met, schedule slippages, or events requiring a major change in project direction. The project manager should also insure that applicable Government and agency regulations are followed, pertinent Federal standards are applied, and total system requirements are met.

DEVELOPMENT OF INFORMATION SYSTEMS AT CUSTOMS IS NOT ADEQUATELY CONTROLLED

The Treasury Enforcement Communications System--actually a collection of over 50 different systems--is not serving law enforcement agents as well or as efficiently as it could.

Changing requirements and an emphasis on quick service have precluded the development of individual systems in a logical, systematic fashion. Key phases of the development cycle are performed out of sequence, not properly completed, or entirely omitted. None had the necessary monitoring and attention during the development process to ensure that what was delivered was what was needed. As a result, systems have been put into use that require redesign or continual modifications, took too long to develop and cost too much money, and still do not meet users' requirements.

We reviewed seven of the larger systems at the Customs data center that were experiencing problems and found a systematic approach was not followed in their development. None of these systems had clearly defined user requirements before the designs began and five had neither a feasibility study nor a cost/benefit analysis performed prior to their development. Many of the current problems with these systems have their origins in incomplete user requirements and functional specifications. None of the systems we reviewed had their functional specifications finalized prior to implementation. Moreover, three systems were developed without any specifications at all. One system had all of its subprograms, over 150, developed on an ad hoc basis because management had directed that the system be implemented as fast as possible. The resulting system has so many problems requiring constant modification that an outside consultant has been proposed to prepare a functional statement for it and define its requirements, neither of which had ever been done.

In another system, a major subprogram was ordered into development after receipt of the fifth draft copy of the functional specifications, and the subprogram has undergone continual modifications as subsequent specifications continue to be drafted by user management. At the time of our review, the thirteenth revision to the specifications had been received by the data center, and the system was being modified again. Another system, originally planned to provide four reports to users, was only partially completed when it went into operation in 1977. At the time of our review, it was still only capable of providing one of the four reports identified in the initial user requirements and functional specifications.

The design and development of information systems is a labor-intensive process and the costs of redoing the work is high. For example, one of the systems discussed above had to be redesigned in order to meet the users' requirements for timely information. Approximately 6 months of one individual's time was required at a cost estimated at almost $17,000. In all, we identified eight systems requiring redesign efforts so that they will better meet the users' needs. Four have been completed, two are in process, and the other two are planned. This work could have been avoided had the users' requirements been clearly identified and agreed to before work commenced and if the entire development process had been better managed.

The biggest cost of poorly designed information systems--the inability of the agency to effectively carry out its mission--cannot be quantified. For example, computerized information systems that are not properly designed often break down and cannot be used by anyone. During the 1-year period ending in June 1980, one or more of the enforcement systems were out of service 13 percent of the time. During 1 month of this period, January, there were 48 reported instances of systems breaking down that made them unuseable a total of 71 hours. The causes are shown in the following table.

Number of systems outages	Cause
26	Incomplete design, functional specifications, and related documentation
10	Insufficient monitoring, editing, and testing of programs before being released to users
5	Inadequate operating manuals, instructions, and training
3	Inadequate planning for data base growth
4	Other
48	

Another important step in the development cycle is providing adequate training and operating manuals to the users so that information systems can be utilized to their full potential. According to one senior official we spoke with, however, the lack of training provided users is a serious weakness at Customs. Of the 10 field locations we visited, 2 had no operating manuals at all. Other users we spoke with had complaints of manuals being difficult to use and requiring extensive amounts of time to locate instructions. They also complained about the lack of training on how to adequately use the different systems. Two systems were put into operation without user manuals being prepared.

INFORMATION PROCESSING NEEDS AT THE BUREAU OF ENGRAVING AND PRINTING ARE STILL NOT BEING MET

The lack of standardized and formalized systems development procedures at the Bureau of Engraving and Printing has had a significant role in the Bureau's failure to employ computer resources to their full potential. Top management and information system users have not assured that needs are clearly defined, that the development process is carried out in a systematic fashion, and that the final product is tested and approved before being released to users. The results have been information systems that took an excessive amount of time and resources to develop and were either abandoned, only partially implemented, or else required substantial modifications. While we were preparing our report, we learned that the Bureau was making substantial efforts to improve system development procedures. We did not evaluate these efforts; however, the Bureau should ensure they they provide for specific measures to correct the deficiencies noted below.

All of the 11 information systems that we reviewed at Engraving and Printing experienced significant problems. Three systems had problems attributable to inadequate long-range planning (see ch. 3), and four systems either did not work at all or else did not perform up to expectations because they lacked top management and user control during their development. The remaining four systems had serious deficiencies caused by a combination of poor planning and systems development. The planning problems associated with these systems were also discussed in chapter 3.

The major problem we noted in the development of information systems at the Bureau was that there is no means of ensuring that users' needs are fully defined and agreed to. Consequently, requirements are added or modified during the development process requiring continual revisions to design efforts. For example, although work was initiated in 1976 on a Manpower Analysis and Reporting System, until March 1981 there was still some disagreement as to what information would be provided the user and the system was not performing satisfactorily. Two years after the project was initiated, the chief of the primary user group notified the Bureau's data processing group that, although staffs from both groups had been working together on the system, the proposed design was incomplete. He offered another proposal that would incorporate the needs of four user groups into a single monthly report. Another year passed, however, until the project was taken up in earnest in July 1979 at the direction of new management. Neither a feasibility study nor user specifications were prepared.

The system finally became operational in September 1979 but users complained of inaccurate, untimely, and unneeded data. One problem, we were told, was that the user group did not have a sufficient number of trained staff to enter the necessary data into the system. Another problem was with the system's design. Users of the system told us that they needed immediate access to information on a selective basis. The system, however, furnished bimonthly, voluminous reports with data that was weeks old to a number of personnel staff who had no use for it. Finally, in February 1980--7 months after the system was put into operation--the user and data processing groups met, acknowledged the problems with the system, and reached an agreement to stop producing the reports and, in the interim, provide users adequate training on how to enter data into the system. Because most of the data was erroneous anyway as a result of a Bureau-wide reorganization in January 1979, work was started reentering employee information into the system. This was finally completed in March 1981 and the Bureau is currently attempting to modify the system so that data can be furnished on a selective basis.

As another example of user needs not being adequately defined and agreed to, one information system to record disciplinary actions was finally abandoned after users had not requested any reports from it in over a year. We were told that the reason the system was not used was that output had become inaccurate and untimely since users were no longer entering information into the system. The system duplicated information already available on manual records, yet it required additional staff to transcribe the data and enter it in the system.

Another system to keep track of vault inventories has been operational since July 1978, although the users' requirements have never been completely met. In March 1981, a new system was proposed that would fill all of the users' needs. Still another system, the Construction and Maintenance System, had been partially developed but required substantial redesign efforts because the user group had changed the data collection form without coordinating with data services. The Bureau subsequently abandoned the system and modified an existing system to meet the requirement.

Although the Bureau of Engraving and Printing reinstituted a steering committee in 1979 and made it responsible for short- and long-range planning, the committee cannot be fully effective without adequate procedures and controls. A well documented feasibility study and cost/benefit analysis are prerequisites for assessing the potential benefits and merit of a proposed information system as well as assuring users' needs are clearly defined. Of the 11 systems we reviewed in detail at the Bureau, none had a feasibility study prepared nor could we find evidence of cost/benefit analyses having been prepared. Consequently, the committee lacked the necessary means to evaluate proposed systems or those being developed.

For example, in July 1979 the Bureau began developing a Fixed Asset Management System that would control requisitions for new assets and establish an automated file of existing ones as well as calculate monthly depreciation charges on them. A feasibility study or cost/benefit analysis was not prepared before work started, and none were ever submitted to the committee. The original estimated completion date for the system was late December 1979. However, this date was moved back to July 1980 when the committee formally approved the project some 4 months after work had started on it. One month after being approved, the project was suspended when it was realized that input to the proposed system would come from an existing system which was very likely to be incorporated into another system. It was also noted that output from the proposed system would be an integral part of an overall financial reporting system which was being planned. Consequently, it was not certain what kind of information was needed or in what format and how frequently it should be provided. By the close of our review, the committee had decided to abandon the system and adopt one used by another Treasury bureau.

Another proposed information system, for automating the cost accounting function for currency production, was approved in June 1979 without a feasibility study or cost/benefit analysis. The Bureau planned to share development efforts with a commercial contractor and the system would have been operational by the end of the year. However, because the system's requirements were underestimated, it was not possible to have the system ready by that time. In December 1979--the original estimated completion month--the office that had requested the system approved the specifications. These specifications were subsequently changed when another group requested additional information be collected. Shortly thereafter, the contractor decided not to participate in developing the system. Faced with doing all of the work itself, the Bureau had to reschedule the system's completion date, and it was not completed until June 1981.

Other problems have been caused by inadequate testing of information systems before releasing them. A system to measure press activity, the second to be automated at the Bureau, was brought into operation in 1974, modified shortly thereafter, and used for 10 months although never with a great deal of user satisfaction. The system was finally abandoned after several attempts over the years to correct it. Another system to measure the monthly cost of operations was released without adequate testing and produced inaccurate reports and required extensive modification to correct the problems and integrate it with other systems. As of July 1981, the required work had yet to be accomplished.

DEVELOPMENT OF INFORMATION SYSTEMS IS A TREASURY-WIDE PROBLEM

The problems we identified with developing information systems at the Customs Service and the Bureau of Engraving and Printing exist, at least to some extent, at other Treasury bureaus as well. For that matter, prior GAO reports have shown they also exist to some degree throughout the Federal Government. Despite an abundance of literature detailing the procedures necessary for effective and cost efficient systems development and numerous internal and external reviews at Treasury bureaus showing the results of not having these procedures in place, these problems continue. The Department of the Treasury needs to place increased emphasis on efforts to assure that all Treasury bureaus have standardized and formalized system development procedures in operation and that previous recommendations calling for these procedures have been effectively carried out.

During our review, we noted many instances of inadequately developed information systems being reported to management. Some only dealt with symptoms, such as general user disatisfaction or a lack of training and users' operating manuals. Others were very specific but were directed primarily at the data processing function. All stressed the need for top management and user involvement and participation in the development of information systems. For example, in March 1978, an internal audit at the Secret Service pointed out that users of the Service's information systems complained of inadequate operator training and manuals, systems too complicated to use, and nonstandardized input data. Similarly, a report based on an internal examination of the Office of the Comptroller of the Currency later that same year stressed the need for improved communication and coordination among users, senior management, and systems developers. The report also recommended that development procedures be standardized and formalized so that information systems could be assured of a systematic, logical development process.

In 1979, internal audits at the Internal Revenue Service and the Bureau of Alcohol, Tobacco and Firearms urged implementation of policies and procedures for systems development similar to the ones we describe earlier in this chapter. The problems that we identified with systems development efforts at Customs and the Bureau of Engraving and Printing were also reported to these agencies prior to our review. In 1978, a consulting firm reported to Customs essentially the same findings that we identified, characterizing top management and user participation and control in the systems development process as limited and resulting in inadequate systems of limited value. This theme was repeated in three subsequent internal evaluations. At the Bureau of Engraving and Printing, a review by a Government consulting group in 1977 and a Treasury Department review in 1979, as well as internal audits in the interim, all noted the same deficiencies with the same results. Inadequate planning, control, and needs analysis had led to development of segmented, nonintegrated "islands" of automated systems that often did not work.

Even if a bureau has standardized and formalized systems development procedures in place, problems can still occur if they are not properly used. For example, during our review we were impressed by systems development procedures at the Bureau of the Public Debt. We noted, however, that the Bureau was preparing to enter into a contract with a commercial time-sharing service on an emergency basis. The contract, which was to be awarded noncompetitively, would provide teleprocessing services for the sale of Treasury bills and was expected to cost approximately $1.3 million over an 18-month period. Although a feasibility study had been prepared, we noted a number of deficiencies that indicated it had not been properly reviewed. Specifically, the study

--proposed the replacement of one interim data processing system with another temporary system;

--failed to demonstrate that a public exigency existed;

--did not specify what problems were occurring or how they would be resolved; and

--failed to identify and consider alternative solutions, including the Bureau's own data processing capability.

Public Debt began developing an automated system for processing the sale of Treasury bills in 1977 after a requirements study had been prepared and agreed to by the Bureau's data services group and the primary users of the system. After about 1-1/2 years effort, almost $500,000 in costs, and approximately 4 months away from full implementation, the project was cancelled when it was decided by the user group that an online system with immediate access to the data was needed. The Bureau then decided to develop a semiautomated system for issuing interest checks as a short-term solution and, as a long-term solution, to develop an online system internally for all Treasury securities. The interim system went into operation in July 1979, approximately the same time the sales of Treasury bills began to rise dramatically due to the unprecedented increase in interest rates.

Almost immediately after it went into operation, the requesting office began to complain that the system was inadequate for the workload, and a sole-source contract was proposed as a means of coping with the problem. However, as we pointed out to the Bureau, the documentation prepared to justify the procurement was questionable in several regards. It was not possible to determine if a problem existed, exactly what the problem was, and how conditions would be improved by the purchase of commercial services. The Treasury Inspector General, in a subsequent review, concurred. In the interim, on the basis of the concerns we raised with the inadequacy of the feasibility study, the Bureau agreed to terminate efforts to award the proposed contract and began a more thorough, comprehensive analysis of problems with processing Treasury bill sales and the available alternative solutions.

CONCLUSIONS

The lack of management controls and procedures for information systems development in the Department of the Treasury does not ensure effective use of Treasury's computer resources. Lack of user involvement and participation in systems development projects has contributed to reduced service to users and has increased the cost of computer operations. The ultimate effect has been to limit Treasury's effectiveness in meeting its mission objectives and requirements.

RECOMMENDATIONS

We recommend that the Secretary of the Treasury direct the designated senior official to ensure that the Department's bureaus develop and implement standardized and formalized systems development procedures, as described in this chapter. The procedures should

--provide a logical and systematic approach for developing systems,

--assure mutual agreement and understanding between users and systems development staff as to what the end product will provide, and

--provide the steering committee and management at all levels a mechanism for reviewing progress and problems at key decision points.

AGENCY COMMENTS AND OUR EVALUATION

The Assistant Secretary for Administration concurred with the need to improve the way information systems are developed throughout the Department (see appendix). We were informed that further actions in this regard will be pursued in light of the requirements of the Paperwork Reduction Act of 1980. She did not specify what actions would be taken.

The Assistant Secretary noted that some assistance in developing systems is available to the bureaus through Treasury's handbook for computer management. We agree. As we pointed out on page 6, many of the elements of the systems development process that we have discussed in this chapter are in fact already called for in the Department's handbook. There is still a need, however, for the senior official to incorporate all of the elements discussed in this chapter into the handbook and then enforce them.

The Assistant Secretary stated that, given the differences in resources and activities of the various bureaus, there is no advantage to having one set of systems development policies for all of them. She pointed out that policies should be fitted to the particular situation in each bureau. She stated that the steering committee approach is only one way to achieve efficient utilization of computers.

We agree that a steering committee is only one part of the solution. To function properly, the committee needs adequate tools such as effective systems development procedures. We disagree that policies should be fitted to individual bureaus. The systems development approach we have discussed in this chapter consists of policies that should be adhered to in any organization that has a data processing function. Implementing these policies, however, will require establishing specific procedures appropriate to the size and mission of the organization.

The Assistant Secretary also noted that management involvement and user participation, in and of themselves, do not guarantee successful systems. She stated that they are merely important and necessary elements in any major initiative. She pointed out to us that, even though top officials at the Bureau of the Public Debt had been directly involved in attempting to acquire teleprocessing services, the proposal still had problems and efforts to acquire these services had to be terminated.

We agree with the Assistant Secretary's position. As we discussed on page 42, the difficulties experienced by the Bureau of the Public Debt are the result of not following the systems development procedures the bureau already had. Our recommendations, once implemented, will allow the Department's senior official to ensure that each Treasury bureau has procedures that incorporate all of the features discussed in this chapter and that their use is consistently followed throughout the Department.

CHAPTER 5

PERFORMANCE MANAGEMENT ASSURES GREATER CONTROL OVER COMPUTER RESOURCES AND ENHANCES PLANNING AND SYSTEMS DEVELOPMENT EFFORTS

Just as any other tool, computer resources should be continuously monitored, assessed, and refined to make certain they are performing properly, at a reasonable cost, and are meeting user requirements. Computer performance management is a formalized program of measurements, evaluations, and reporting, with specific goals and objectives. It is invaluable for providing top management and users control over scarce and valuable resources. Without it, an accurate assessment of current capacity and capability cannot be made and, consequently, proper planning for future requirements is impossible. A performance management program, if properly implemented, also ensures that new information systems are developed as efficiently and effectively as possible to reduce costs and maximize service.

Despite a long recognized need for performance management programs both Government-wide and within the Department of the Treasury, progress in implementing them in the Department's bureaus has been slow. Although some bureaus have done limited testing and evaluation of equipment utilization, these efforts are not part of a continuing performance management program and the results are less than fully effective. The lack of performance management programs in Treasury bureaus has resulted in computers being underutilized and inefficient information systems that require more equipment and processing time than is necessary. Furthermore, their absence has compounded planning and systems development deficiencies by not identifying the resulting problems for management.

COMPUTER PERFORMANCE MANAGEMENT: MEASURES, STANDARDS, AND REPORTING

A performance management program measures, evaluates, and reports on the efficiency and effectiveness of computer resources. In such a program, key performance data is systematically collected and compared with predetermined standards. The results of these comparisons are routinely fed back to management in a concise, usable format. A performance management program is vital for assuring current resources are properly used and that the requirements of users are being met as economically as possible. The evaluation tools used in such a program range from simple user satisfaction surveys to high technology monitoring devices for computer utilization. Whatever techniques are used, however, they can never solve problems in themselves but only reveal them. An effective performance management program furnishes top management and users with the information they need to increase the likelihood that decisions they make will result in improved service at the least cost.

In recent years, a great deal of material has been published by various sources concerning computer performance evaluation and its role in an effective performance management program. Similarly, we have issued numerous reports that point out how such programs can benefit Federal agencies. 1/ In addition, the National Bureau of Standards and the General Services Administration have both issued guidance for Federal agencies on implementing performance management programs.

The particular procedures used in performance evaluation differ greatly in complexity. Selecting the most appropriate method is a function of the size and nature of the data processing operations. An effective performance management program, however, should have a common focus: The collection and reporting of performance measurements to management and a concerted effort to maximize productivity and user satisfaction while minimizing costs. Some of the specific aspects of performance management should include:

--Developing a systematic approach for assessing computer programs and output for efficiency and effectiveness and setting priorities for needed modifications.

--Developing and implementing equipment performance goals and standards and a system of measurements to determine how well they are met.

--Assuring proper justification of new equipment by constantly measuring current utilization and capacity as well as forecasting future requirements.

--Consulting on the design of new systems to assure maximum efficiency and effectiveness.

It should be emphasized that a performance management program in itself does not assure the best use of computer resources. To be fully effective, performance management must have the full support of and receive adequate guidance from top management. Most Treasury bureaus have done little in the way of periodically measuring processing capacity, improving efficiency, and regularly reporting to management. Others have made some efforts but lack a complete, systematic performance management program. Consequently, their results are not used as effectively as possible.

1/A recent example is "Department of Agriculture Needs Leadership in Managing Its Information Resources" (CED-81-116, June 19, 1981).

An effective performance management program should be centrally directed and controlled so that efforts can be coordinated for all of an organization's computer resources. This is especially important when these resources are located at more than one site or within different organizational entities. Although it should have a solid background in data processing, a performance management staff need not necessarily possess highly specialized technical expertise. Skills that might sometimes be necessary to perform tasks such as reviewing software or equipment efficiency can be contracted for on a temporary basis with very successful results.

A performance management staff, whatever its size and skills, should serve as a means of communication, coordination, and sometimes of negotiation, between computer services management and the steering committee. Consequently, we believe that for objectivity, the program should be administered by a staff that is organizationally independent of the data services group and that is given a formal charter with sufficient authority to function properly. Ideally, and especially for agencies with a large amount of computer resources, the program should be administered by the steering committee's support staff or as part of the duties of the individual named at the bureau level to oversee computer resources. (See ch. 2.)

THE MINT'S PERFORMANCE MONITORING EFFORTS NEED TO BE PART OF A SYSTEMATIC MANAGEMENT PROGRAM

Computer utilization statistics that are collected at the Bureau of the Mint's data center in San Francisco, California, are not used correctly or interpreted properly. Top management at national headquarters in Washington, D.C., has been misinformed as to how much processing capacity exists and the computer is not used to its full potential. We estimate the computer's workload could be almost doubled. Besides not being used as much as it could be, the Mint's computer has more peripheral equipment--tape drives and disk devices--than it needs. On the basis of the limited data available, we believe that some of this equipment would still be excess even if the computer was used to its full potential. The utilization measurements taken at the Mint's data center serve little purpose other than billing non-Mint users of the facility. A systematic, coordinated, and comprehensive performance management program--based on the utilization data currently available and other, more appropriate measurements--is needed to better assess the center's workload, ensure that the center and its equipment are effectively used, and better plan for equipment acquisitions.

In 1975, the Mint's data center installed a commercial software package to collect computer utilization information for billing non-Mint users. An accounting package such as this is one of the most basic techniques for performance monitoring but can be very useful as a general indicator of how much and how well a computer is used. Among other things, the package prepares periodic reports and monthly summaries of the amount of time the computer was available, active, and actually processing. Available time is the time that the computer was ready for use. Active time measures how much the computer was used during the time available. However, even though a computer is active, it is not actually busy the entire time since after it performs an operation it must wait for further instructions. Processing time, therefore, measures how much the computer was actually busy during the time it was active.

During our review, we reported to the Director of the Bureau of the Mint that the utilization statistics collected at the data center were not being properly used and were often misleading because they were being misinterpreted. 1/ In testimony before congressional appropriations committees in 1980, Bureau officials had reported that:

--The current average monthly utilization rate of the Mint's computer was approximately 65 percent.

--The utilization rate increased to between 70 and 80 percent when certain information systems were processed concurrently.

--The utilization rate approached 100 percent during some peak periods.

These figures, however, were not an accurate representation of computer usage at the center. The 65 percent average utilization rate cited in the testimony was only for 1 month. Over the 1-year period previous to the month reported on, the average was 58 percent. Furthermore, the concurrent processing of systems that was referred to occurred only twice a year. Finally, the only time the utilization rate ever approached 100 percent was during otherwise slack periods when a special program was run to monitor the efficiency of various applications.

Notwithstanding the problems we noted with the use of measurements, our major concern was with their misinterpretation. The utilization rate used by the Mint measures the percentage

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1/ "Opportunities Still Exist to Better Use the Mint's Data Processing Center" (GGD-81-64, March 27, 1981).

of time the computer is processing while it is active. Consequently, idle time--when the computer is available but neither active nor processing--is not accounted for. We believe it would be more accurate to measure the computer's processing time as a percentage of the time available. If calculated in this manner, the computer's utilization rate is 46 percent for the same 1-year period that the Mint assumed 58-percent utilization.

The Mint's computer is a high-performance machine and, with adequate preventive maintenance, should be capable of processing at close to 100 percent of the time it is in use. Consequently, by improving the efficiency of systems to decrease the time spent by the computer waiting for instructions, and by using the computer more of the time that it is available, its workload could be substantially increased. Since the Mint's computer was, on average, processing 46 percent of the time available, and allowing for a 15 percent contingency factor, we estimated that 39 percent of the computer's potential capacity was unused. In other words, the current workload could almost be doubled.

The Mint's computer also serves other Treasury bureaus and Government agencies. We estimated that at the rates being charged to non-Mint users, the computer's unused capacity represented a loss in annual billings of over $1.2 million. More importantly, however, the possibility exists that other agencies or bureaus might be incurring unnecessary expenses for data processing equipment or services when the Mint's facility could be used to meet their requirements.

On the basis of our analysis of the limited utilization data that was available for peripheral equipment, we also questioned the number of tape drives and disk devices used to support the computer. We noted that consultants, in an earlier performance evaluation in November 1978, had generally the same concerns. Our analysis of tape and disk use over a 1-year period showed that the data center had sufficient peripheral equipment to easily absorb the almost doubled workload which would result from using all of the computer's capacity. Moreover, even if the computer were used to its full potential, there are strong indications that the center would still have more equipment, especially disk devices, than was needed. However, as we pointed out to the Mint's Director, the exact number of excess tape drives and disk devices cannot be determined unless more appropriate tests and measurements are performed and the results carefully analyzed.

As shown above, even though the Mint's data center was measuring computer performance to some extent, the results were not very useful. In fact, what data that was reported resulted in management being misinformed as to how much the computer was being used. We believe that the problems experienced by the Mint point out the necessity for a coordinated and carefully developed performance management program to ensure that the appropriate performance measurements are taken and the results properly evaluated and reported to management.

PERFORMANCE MANAGEMENT PROGRAMS COULD IMPROVE COMPUTER RESOURCE MANAGEMENT THROUGHOUT TREASURY

Although other Treasury bureaus besides the Mint have also done a limited amount of performance measuring, testing, and evaluating, these results have not been used as much or as well as they might have been. Top management and users, for the most part, have failed to use or rely on these efforts as part of an organized program for continually monitoring and improving the use of computer resources. By implementing performance management programs, Treasury bureaus could maximize the benefits of any performance evaluations that are done, as well as provide top management and users a permanent means of assessing the performance of data processing operations.

An estimate of the cost savings and improved effectiveness that could be achieved in Treasury bureaus through performance management programs cannot be quantified since little has been done to assess the existing inefficiencies. The potential, however, is substantial. For example, officials at the Customs computer center in San Diego, California, have said that the efficiency of systems run at the center could be significantly improved. Conversely, improved efficiency could substantially increase capacity without acquiring additional equipment. Data processing staff estimate that the cost of improving the efficiency of the systems could be over $700,000. Had a performance management program been in place at Customs to help ensure that systems were as efficient as possible before they were put in use, much of this cost may have been avoided. Furthermore, the Service could have eliminated significant expenses over the years by reducing the equipment at the center.

A few Treasury bureaus have already recognized some benefits from performance evaluation programs. For example, in our June 18, 1979, report to the Commissioner of Internal Revenue (see p. 4), we noted several improvements the Service had made in the efficiency of various information systems through limited use of performance evaluations. These improvements significantly reduced the processing requirements of several information systems, thereby increasing capacity without acquiring additional equipment. We pointed out that these efforts could have an even greater impact if future performance evaluations were conducted as part of a comprehensive program, centrally directed and consistently applied. We recommended that the Service have its planned performance evaluation unit establish a comprehensive, nationwide performance program for all of the Service's data centers, and such a program was established in September 1979.

The benefits from more consistent measuring methods and improved reporting to various levels throughout the Service have been considerable. The Service believes, and we agree, that the program has a potential for even greater accomplishments once it is further refined.

Similarly, the Bureau of the Public Debt has an ongoing performance evaluation effort administered within the data processing group. Section supervisors and branch managers within the group are assigned to monitor the efficiency of different information systems and equipment. By using several software packages to analyze such areas as program logic and hardware configuration, by purging unneeded files, and by using automated job scheduling, the Bureau can better monitor and significantly improve the use of its computer. We were told that these techniques have indefinitely postponed saturating Public Debt's computer which was originally expected to occur in 1979. Although these results are commendable, we believe they would be even greater if the performance evaluations and improvements were part of a coordinated program with a broader scope and administered by a centralized staff outside of the data processing group. As was pointed out earlier, the Bureau of the Public Debt almost awarded a sole-source contract for approximately $1.3 million for commercial processing services which were not necessary. (See p. 42.) Although this situation was caused mostly by an inadequate feasibility study that did not receive sufficient review by top management, we believe that the lack of a performance management program aggravated the problem to some extent. An independent performance management staff reporting to the steering committee, in our opinion, would have been able to more objectively assess the feasibility study that was prepared and point out its deficiencies. Acting as an intermediary between the data processing group and the steering committee, the staff could have assured that the Bureau's own capabilities were adequately evaluated and that the users' perceived requirements were really feasible before a commercial contract was proposed.

We believe that other problems noted earlier in this report, although caused by inadequate planning or systems development procedures, might have been brought to management's attention sooner and the effects thereby alleviated, had an effective performance management program been in place. For example, as we described in chapter 3, the U.S. Secret Service has two identical computers when one would be sufficient. The primary cause is inadequate long-range planning since the Service's needs have never been properly defined. However, a performance management program could have done much to prevent the problem by helping to quantify the Service's requirements and alerting management that excess capacity was being acquired. Similarly, the Bureau of Government Financial Operations might have moved sooner to replace saturated and obsolete equipment had there been a performance management program reporting on the seriousness of the situation. (See p. 27.) In the same way, information systems such as we described in chapter 4 that do not meet users' requirements because of improper development efforts can be readily identified by a performance management program that periodically assesses user satisfaction and reports routinely to appropriate management. Prompt identification of such systems ensures that expensive resources are not being used on systems or reports that do not meet user requirements.

CONCLUSIONS

A coordinated and comprehensive performance management program is a prerequisite for the proper planning and controlling of computer resources and assuring that users' needs are being met. A well organized and formalized program of periodic measurements, evaluations, and reports on the efficiency and effectiveness of data processing operations is essential for top management and users to ensure that current resources are used well and that future acquisitions are justified. Every Treasury bureau should have a centralized, independent program in effect with a recognized function in the planning and systems development process. The size, organization, and specific duties of the staff administering the program should be consistent with the amount and extent of data processing operations within the bureau. Similarly, the degree of sophistication used to measure and evaluate the performance of computer resources should also be a function of how extensive and technologically advanced the equipment is. The size of the program, as well as the amount of staff to carry it out and the tools and techniques to be employed, should be determined only after their costs are carefully considered in relation to the benefits that can be derived.

Although some Treasury bureaus have done limited testing and measuring of equipment utilization and in some cases have evaluated performance, these efforts constitute only part of an effective performance management program. Other critical elements, such as establishing standards and goals, periodically assessing products, and optimizing software efficiency, have been lacking. As a result, expensive equipment is not used to its full potential, and information systems use more processing capacity than necessary. Moreover, other problems caused by inadequate planning or systems development have gone unrecognized. A performance management program with periodic reports furnished to top management and users could have revealed at least the symptoms of these deficiencies so that they might have been remedied sooner.

RECOMMENDATIONS

We recommend that the Secretary of the Treasury direct the designated senior official to have each of the Department's bureaus establish a performance management program for computer resources based on the general guidelines discussed in this chapter. The scope and objectives of each program, as well as the measuring and evaluation techniques to be used, should be specifically tailored to each bureau on the basis of a careful determination of what is appropriate for the needs of the bureau and a detailed analysis of the costs of the program in relation to the benefits that can be achieved. At a minimum, each program should focus on

--developing performance standards based on specific user requirements but within the limits of overall capacity and capability,

--periodic and routine monitoring of the efficiency and effectiveness of the bureau's computer resources in meeting these requirements,

--consistent and uniform reporting to management of performance trends and areas needing improvement, and

--developing and implementing a long-range strategy for improving performance.

AGENCY COMMENTS AND OUR EVALUATION

The Assistant Secretary for Administration generally agreed with our views on the importance of computer performance management but stressed that the costs of performance management should be carefully considered in relation to potential benefits in efficiency and effectiveness (see appendix). She pointed out that a computer performance management program is not a panacea and must be carefully used to be of any real value. She stated that we did not address these necessary caveats in our draft report. We disagree with the Assistant Secretary's observation that we did not address these important cost/benefit considerations. In discussing the features and role of a good performance management program on pages 45 through 47, we have emphasized that the program must have the full support of and receive guidance from key management. Also, as stated in our conclusions on page 52, the program's size and sophistication should be determined only after its costs are carefully considered in relation to the benefits that can be derived.

In her comments, the Assistant Secretary stated that practically every Treasury bureau has a computer management program in place. We disagree. As discussed previously, most bureaus have performed some aspects of performance measurement in the past. However, except for those bureaus we have noted, none of these actions have been part of an overall program, centrally directed and controlled, with established standards and objectives.

The Assistant Secretary took exception with our assessment of how much additional processing could be accomplished at the Bureau of the Mint's data center. She expressed concern that we measured the utilization of the Mint's computer against a full utilization standard which did not consider the additional personnel and other costs to achieve full utilization. She added that, while acquiring a smaller computer would improve utilization, it would be less cost effective than current operations. She pointed out that a recent Departmental review of that facility showed that, under current operating procedures, the computer system was "saturated" by the Treasury payroll system.

The Assistant Secretary did not question the major thrust of our findings as discussed on pages 47 to 50 that the Mint's computer utilization statistics were improperly used and misleading and, as a result, there was considerable excess capacity and some excess equipment, most notably disk drives.

We measured the utilization of the Mint's data center against the time that the computer was available for processing. This means that the computer installation was open for business and the computer itself was not undergoing maintenance or unavailable for any other reason. As discussed on page 49, we found that using this criterion, the workload could almost be doubled and the unused capacity represented a $1.2 million annual loss in billings. We are not advocating the acquisition of a smaller computer. Our point is that if available computer performance data were used and interpreted correctly as part of a good performance management program, this excess capacity would have been revealed to management and appropriate steps could then be taken to tailor the equipment to the workload. Some of these steps would be to aggressively seek more customers and study whether a more cost effective modern computer would do the job.

We reviewed the Department's report on the Mint's data center which was issued while our draft report was with the Department for comment. Because of time limitations, we were unable to fully analyze or verify the material presented in the report. The findings in the Department's report, however, generally agreed with ours and, in addition, raised some further questions about the performance of the Mint's computer installation. Specifically, the study team reported that during the heaviest of the 6 months studied, about 27 percent of the central processing unit's capability was used to measure the efficiency of the computer system itself. The study team reported that this seemed like an excessive amount of the computer's resources just to measure its own efficiency. The largest application--Treasury's payroll system--used only 33 percent of the central processing unit's time. If the computer's usage rate were adjusted to reflect actual work done for customers, the utilization rate would be about 55 percent--a rate lower than the "lowest" month identified by the study group.

The study group also raised additional questions about computer performance at the Mint's data center. In its report, the group concluded that operational problems, such as the chronic failure to fill staff shortages in critical authorized positions, the antiquated manual job scheduling system, the use of prime shift time for preventive maintenance, and the wasteful use of disk resources have degraded the data center's performance.

The Assistant Secretary also commented on our observation that a good computer performance management program would have helped to quantify the Secret Service's computer needs and thereby help the Service avoid procurement of one of its two computers. She informed us that the Department had conducted its own review of the facility after we had reported the excess to the Service's Director in March 1981. However, the Assistant Secretary would not release the study to us for evaluation until it had been reviewed further by Department officials. To avoid delaying the issuance of our report, we are treating the Department's study on the basis of what we were told it contains. Meanwhile, we are continuing our efforts to obtain it.

We were told that the Department's study contradicted ours in that, although there was in fact excess capacity, it was caused by delays in implementing planned systems. To resolve the problem, the Office of Computer Science is assisting the Secret Service to expedite the development of additional systems to run its computers. We were also informed that the Secret Service had reviewed its contract with the computer vendor and had found that returning one of the computers would result in a net increase in payments over the remainder of the contract.

As was pointed out in our report to the Director, the Secret Service had operated with a single computer until 1973 when, faced with limited capacity, it acquired a larger, more powerful computer. The Service kept the old computer to supplement the new one because the old one was paid for. These two computers were replaced in 1976 by two identical computers on a sole-source basis with the stipulation that they be competitively replaced within 3 years. This stipulation was met with the most recent procurement in 1979. Neither the 1976 nor the 1979 procurement was justified on the basis of workload or the necessity for dual computers. We continue to believe that a good computer performance management program would have done much to identify the excess capacity acquired in 1979 because of inadequate long-range planning (see p. 28).

We considered the additional automation the Service was planning when we reported that, in our opinion, one of its computers had more than enough processing power and capacity to handle the current workload as well as increases planned for the future. We based this opinion on our evaluation of the Service's long-range plan which had been prepared in 1980--7 years after the Service began using dual computers. We also pointed out in our March 1981 report that, once the Service had done further planning and could estimate the requirements of the additional uses, the capacity of one of its computers could be as much as doubled by incremental additions, if necessary. Neither the Service nor the Department has provided us with any information on future applications not included in the 1980 long-range plan. However, we are continuing our efforts to obtain and evaluate the Department's study and, should it materially affect our position, we will address any changes in a supplement to this report.

The Secret Service provided us information it received from the computer vendor which showed that returning some of the computer equipment to the manufacturer would actually result in a net increase in payments. This cost comparison was based on the assumption that the Service would be returning only the central processing unit and memory of one of its two computers. However, each of the Service's computers consists of a number of components, such as tape drives, disk devices, terminals, and other input/output devices and control units. We do not believe it is reasonable to expect that the Service would require as much peripheral equipment as it now has should one of the central processing units and some memory be returned. Consequently, the vendor's analysis does not account for the total reduction in payments possible if all of the unnecessary equipment is returned. Since the cost of the central processing unit and memory is only 26 percent of the total cost, the potential for additional savings is significant. As was pointed out in our March 1981 report, although there is definitely an excess of computer equipment at the Secret Service, the specific unnecessary components can only be identified after a careful determination of the Service's data processing needs. In the absence of any information to the contrary, we believe that the Service has yet to make such a determination.

The Service's contract gives fixed discounts based upon total list monthly payments. As a result, reducing the monthly list payments by the cost of a central processing unit and memory would place the Service in a different bracket with a discount less than half of what the Service now enjoys. On a monthly basis, this difference in discounts is approximately $8,000 greater than the savings caused by returning the equipment. However, returning equipment would not always result in an increase in the net monthly cost. If the Service returned more than a central processing unit and memory, or even less, the net monthly cost could in fact decrease depending upon what discount the Service would qualify for. Consequently, until the Service identifies exactly what equipment is excess and could therefore be returned, it has no basis for determining whether its net monthly cost would increase or decrease.

The contract awarded by the Service does, in effect, penalize the Service to some extent for returning equipment. Because of the contract's discount structure, reducing the monthly list price can result in a less than proportional reduction in the net monthly price. As shown above, in some cases the net monthly cost could actually increase. We question whether such a contract is in the best interests of the Government or if the Service adequately considered the contract's penalizing effect before awarding it. Because of these concerns, we have referred the matter to Treasury's Inspector General. In any event, we continue to believe that the Service's costs would have been substantially less had one computer been bid on instead of two.

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

ASSISTANT SECRETARY

NOV 30 1981

Dear Mr. Anderson:

We have reviewed your draft report entitled, "The Treasury Department and its Bureaus Can Better Plan for and Control Computer Resources." This letter and enclosures provide the Treasury Department position on the recommendations contained in the draft report.

In general, we concur with the report's comments regarding the need for improvements in system planning and analysis within the Department. In particular, we agree that, in the past, insufficient staff resources have been applied to the area of policy oversight in computer operations. Although major improvements are difficult to achieve in the current budgetary situation, we are actively taking a number of steps to improve this situation:

- I have asked the National Academy of Public Administration to review our ADP planning efforts, as part of an overall policy review of Treasury payroll and personnel systems.
- The task force implementing the Paperwork Reduction Act is devising a plan for improved integration of information management activities. Improving the acquisition and utilization review processes for computer resources are an important part of that overall effort.
- I have asked the Office of Computer Science to develop a comprehensive, long-range planning process for computer management. This process will be coordinated with the general information management planning process mentioned above, will involve all constituent components of the Treasury Department, and will provide Department management, for the first time, with the information necessary to relate individual bureau proposals to each other and to overall priorities.

Although we agree with the draft report's fundamental recommendation about the need to strengthen Departmental planning and oversight in this important area, we do not concur with the report's position that the best way to achieve such a change is to create a new Assistant Secretary for computer management, as well as similar positions in each bureau within the Department.

In principle, we disagree with the notion that the best way to solve organizational problems is to push them up the hierarchy through the proliferation of top-level offices. This conclusion (which appears in GAO reports on a large number of issues) is neither based on sound theories of public administration nor on factual evidence. In this case, GAO has apparently not calculated the additional costs that would be incurred in establishing and staffing such offices, the effect of such a change on other managerial functions, the drain on operational resources involved in providing necessary support staff, the coordination difficulties that would be created by separating computer management from other information-management and resource allocation offices, or the different circumstances that exist in Treasury's constituent bureaus. Nor has the draft report documented that management attention has been insufficient under current arrangements. In the absence of such evidence, Treasury cannot concur in this recommendation.

In another area, we are concerned about the draft report's application of a measurement standard calling for "full utilization" of existing computer equipment, without consideration of such other factors as the overall cost-effectiveness of equipment at hand. For example, a Departmental study demonstrates that the computer system in use by the Bureau of the Mint is more cost-effective than a smaller system, even though the utilization factor of such a reduced system would be larger in the short run. We suggest that this recommendation be re-examined in light of overall cost-effectiveness standards.

Enclosed to this letter are detailed comments on each of the recommendations contained in the draft report. We appreciate the opportunity to comment on the report.

Sincerely,

for Cora P. Beebe
Assistant Secretary
(Administration)

Mr. William J. Anderson
Director, General Government
Division
U.S. General Accounting Office
Washington, D. C. 20548

Enclosures (7)*

*GAO Note: In the interest of brevity, we have included only one of these enclosures, the Department's overall response. The other enclosures were replies from Treasury's Office of Computer Science and several bureaus which either were incorporated in the overall response or else did not dispute any of the information presented in this report.

Department of the Treasury Reply
to
GAO Report

"The Treasury Department and Its Bureaus Can Better Plan for and Control Computer Resources"

Summary of GAO Conclusions and Recommendations --

Purpose

The GAO spent three years reviewing the acquisition, use, and management of computer resources in the Treasury Department.

Scope

The review was conducted at Treasury headquarters and most of the Bureaus in the Department. It covered (1) the way the Office of the Secretary (OS) exercises policy oversight and management control over computer resources, and (2) how the Bureaus justify and use the computer resources they acquire.

Methodology

The report is based on:

(1) Ongoing discussions with a large cross section of Departmental ADP personnel, with special emphasis on those in the Office of Computer Science (OCS);

(2) Reviews of various policy documents which establish Treasury's ADP management role, at both the Department and Bureau level;

(3) Reviews of specific computer acquisitions within the Department, including how they were justified, how they were acquired, and how they were subsequently used.

Conclusions and Recommendations -- Chapter 2

GAO concludes that Treasury can better manage computer resources throughout the Department.

- Treasury has lacked effective, centralized control over computer resources.
- The Office of Computer Science has lacked staff and authority to effectively oversee computer resources.

-- The Office of Computer Science has conflicting responsibilities.

-- The Paperwork Reduction Act can provide more effective centralized management for Treasury's computer resources.

-- The Paperwork Reduction Act will require careful implementation by the Department of the Treasury.

-- The concepts embodied in the Paperwork Reduction Act should be implemented in each Treasury Bureau.

-- The Assistant Secretary for Administration is not an appropriate choice for Treasury's Senior Official.

GAO recommends that:

(1) The Senior Official's duties should be limited to those required by the Paperwork Reduction Act.

(2) The Senior Official should be provided with sufficient rank to demonstrate the importance of the position and to facilitate the implementation of appropriate policies.

(3) The Senior Official must have adequate resources to meet the responsibilities imposed by the Act.

(4) Each Bureau should designate its own senior official, to function under the guidance of the Departmental official but reporting directly to the Bureau head.

Department of the Treasury Position

In general, the Department believes that the oversight function should be strengthened and steps to accomplish this have already been taken. However, we believe that the draft report understates the extent of the oversight now provided. Specifically, the report failed to take into account Treasury Directive 10-08, Management of Automatic Data Processing Handbook. This handbook, prepared by the Office of Computer Science, provides a workable framework for the management of computer resources throughout the Department. It also provides necessary managerial flexibility to meet the different needs of Treasury's constituent bureaus.

While there is some truth to the statement that insufficient staff within OCS is dedicated to policy oversight, some other factors need to be considered. In carrying out its policy responsibilities, OCS freely uses staff from other elements within OCS, other offices within OS, other Bureaus and various other sources outside the Department. For example, when OCS conducted a Facility Review of the Customs Computer Center in San Diego in 1978, an OCS analyst headed the team. But the other team members came from the Bureau of Government Financial Operations (BGFO), the Mint, and the Federal Computer Performance Evaluation and Simulation Center (FEDSIM). This arrangement insured a balanced approach to the review, and also provided useful experience to the par-ticipants. This process, which has existed for some years, provides a realistic alternative to a major augmentation of OCS permanent staff. In addition, OCS currently has contractual assistance in performing many of its oversight functions. At a time when the Department is experiencing significant budget cuts, such alternatives are necessary and prudent.

The report has not presented any evidence to support its conclusion that OCS lacks sufficient authority to carry out its mission. In those unusual cases where disagreements between OCS and a Bureau cannot be resolved informally, the Assistant Secretary (Administration) exercises sufficient authority to resolve the matter. The Department therefore rejects this conclusion.

Since OCS operates a Computer Center on which it sells time, GAO concludes that there are conflicting responsibilities. This problem is purely one of perception. There is no evidence to support this conclusion. The report has not provided any examples where OCS judgment in the policy area was affected by the existence of the Computer Center. By contrast, the Department believes there is considerable value in allowing policy personnel to see first-hand operational realities within a common organizational framework.

The Department has previously considered the feasibility of an independent oversight organization and rejected it. Enclosure 3 provides a detailed discussion of this issue.

The Department agrees that, with careful implementation, the Paperwork Reduction Act can provide more effective centralized management for Treasury's computer resources. A task force has been formed, including personnel from OCS, to map out the implementation of the Act. Rather than concentrating on only computers, the task force is looking at all aspects of the Act and developing on integrated approach for implementing it, while also linking other significant elements in the Department affected by the Act. This approach will ensure that Treasury gets the maximum benefit from the Act with the limited available resources. It must be remembered that the Paperwork Reduction Act addresses more than computers. We believe that an integrated approach is more effective.

The report's recommendations for a senior official in each Bureau is not entirely acceptable. What is appropriate for the IRS, with immense regulatory activity and more than half a billion dollars devoted to ADP, is not appropriate for the Federal Law Enforcement Training Center, with minimal activity in data processing. Treasury is composed of a wide diversity of Bureaus, with different sizes and different activities. In some Bureaus, the Senior Official approach may be quite effective. For example, IRS has an Assistant Commissioner of Data Services who is responsible for practically all the data processing in that Bureau. But we do not believe in uniformity for its own sake, regardless of circumstances.

We reject the report's assertion that the Assistant Secretary (Administration) is not an appropriate choice for Treasury's Senior Official, and that the Senior Official's duties should be limited to those imposed by the Act. The Act and OMB's guidance insist only that:

a. The Senior Official have full authority to carry out the responsibilities required by the Act; and

b. Adequate resources be allocated to the function to ensure that the intent of the Act is satisfied.

The report's objection centers on the danger of a perceived lack of objectivity due to a possible conflict of interest. There is no evidence presented to show the existence of such a problem.

We agree that the Senior Official must be of sufficently high rank to demonstrate the importance of the position. This is not only required by the Act, but it also makes sense if the Official is to be effective. We believe that the Assistant Secretary (Administration) holds sufficiently high rank to demonstrate this importance. We also concur with the need for adequate resources. In conclusion, we find disturbing the report's apparent policy position that computer oversight can only be effective if the senior officials charged with this function have no other significant responsibilities. By contrast, we believe that both the increasing linkage of computer policy to other management areas and long experience with single-interest policy oversight offices indicates that such an approach would actually decrease the effectiveness of the oversight function.

Conclusions and Recommendations -- Chapter 3

GAO concludes that Treasury Bureaus need better long-range planning to relate mission needs with computer resources.

- A coordinated approach to planning for computer resources is crucial.
- Computer technology planning requires an agency-wide perspective.
- Cost accounting for computer resources and services is essential for the Steering Committee to function properly.
- Planning for computer resources is still a problem in Treasury's Bureaus.
- The Bureau of Engraving and Printing is not using computer technology as much as it needs to.

- The use of computer technology at the Customs Service lacks direction.

- The Bureau of Government Financial Operations has not expanded computer capability to meet its increasing workload.

- The Secret Service has excess computer resources.

- Other Treasury Bureaus have made limited progress in computer resource planning.

GAO recommends that:

(1) Steering Committees, along the lines which GAO describes, be established in each Bureau.

(2) Computer resource accounting systems be developed and installed in each Bureau.

Department of the Treasury Position

Treasury now has the framework of a coordinated approach to computer management under the aegis of Treasury Directive 10-08, which requires the development of long-range plans in this area. Virtually every Bureau prepares five-year plans under TD 10-08 for the allocation of computer resources.

In this area particularly, however, Treasury has found the utility of long-range plans to be somewhat limited. There are several reasons why this is so: the inherent uncertainties of the yearly budget process, the enormous volatility of both available technology and user demands, and the effects of inflation as well as government-wide fiscal and staffing limits on available resources. These factors--which are not unique to this Department--mean that long-range plans have been most useful as guideposts for incremental decisions, rather than as precise blueprints for future action.

In addition, the planning requirements for computer management are in the process of undergoing significant changes stemming from the mandates contained in the Paperwork Reduction Act, which require a unified approach to information management activities. This Department is in the process of developing a new structure to deal with these emerging requirements.

Given these rapidly chenging circumstances, we find that the draft report's emphasis is too heavily procedural, relying on the application of a specific approach that fails to take into account the enormous differences in missions, size and circumstances within Treasury's operational components.

We do not believe that a steering committee approach is appropriate for every Bureau. As the attachments indicate, several Bureaus have formed steering committees. In addition, the Comptroller of the Currency actually has two steering committees in place. The first, composed of department and division heads, approves initiatives up to $5,000. The second committee, composed of senior bureau management, reviews and approves larger initiatives.

In general, we concur with the need for proper cost accounting for computer resources. This is essential to assure effective utilization of these resources. Several Bureaus, including OS, have implemented systems which are fully in compliance with OMB Circular A-121. All other Bureaus are moving in this direction. The Department will take a more aggressive role in fostering these changes.

Customs Service

In its analysis of the Customs Service, the draft report didn't fully consider the enormous strides made in that Bureau over the last three years. When GAO began its review, computer resources at Customs were housed in three separate organizations. Now, through a major reorganization, all data processing is unified under the Director, Office of Data Systems. This reorganization has effectively changed the direction of data processing. Further, through equipment upgrades in the various regions, Customs has effectively distributed some of its data processing while keeping adequate central control. Finally, Customs has just completed what was effectively an eight-year effort to acquire a single integrated computer system to operate all of its business systems. As in any ongoing operation, more needs to be done, and some things could be done better. But Customs has progressed greatly in the past few years, and has laid out a plan for further success in the future.

Bureau of Government Financial Services

The Bureau of Government Financial Operations just completed a major procurement of additional computers last summer. This acquisition will ensure sufficient capacity while the Bureau plans for and implements a comprehensive redesign of its Disbursing function. GFO has also expanded its capacity in other areas and has made much progress in modernizing its accounting systems. More needs to be done, and further plans to this end are being developed.

Please refer to enclosures 4 to 7 for additional comments on particular Bureaus. In general, the draft report analysis has highlighted some valid problems. The Department has taken or will take the necessary steps to meet these recommendations. The main constraining factor in this effort will be budget restrictions, which may limit our ability to implement some important initiatives.

Conclusions and Recommendations -- Chapter 4

GAO concludes that inadequate control over the development of information systems reduces their usefulness and increases their cost.

- Top management and users should have a formalized role in developing information systems.
- Steering committee involvement during systems development is crucial.
- An orderly approach to systems development is essential.
- Project managers increase users' control over development efforts.
- Development of information systems at Customs is not adequately controlled.
- Information processing needs at the Bureau of Engraving and Printing are still not being met.
- Development of information systems is a Treasury-wide problem.

GAO recommends that formalized and standardized systems development procedures be established, in order to

(1) Provide a logical and systematic approach for developing systems;

(2) Assure mutual agreement and understanding between users and systems development staff as to what the end product will provide; and

(3) Provide the steering committee and management at all levels a mechanism for reviewing progress and problems at key decision points.

Department of the Treasury Position

The Department concurs with the need for improving Department-wide information system development policy through the development of more consistent and appropriate systems analysis and implementation procedures. As previously noted, significant steps in this direction have been taken in the past several years. Further actions will be pursued in light of the requirements set out in the Paperwork Reduction Act. We would note, however, the need to keep the following points in mind:

(1) Some assistance in this area is available to the Bureaus through Treasury Directive 10-08.

(2) Given the disparity of resources and activities of the various Bureaus, we do not see the advantage of one policy for all. Rather, policies should be fitted to the particular situation.

(3) As we have previously stated, the steering committee approach is only one way to achieve efficient utilization of computers.

The draft report also states that a lack of management controls and user involvement has contributed to problems with computers in the Department. We have found no significant instances bearing out this conclusion. For example, the draft report criticizes the Bureau of Public Debt for its attempt to relieve the Treasury Bill crisis. In fact:

(1) This project was managed directly by the Deputy Commissioner and the Assistant Commissioner for Washington Operations.

(2) The Commissioner personally reviewed and signed the various certification documents.

(3) BPD has had a steering committee in place for some time.

The proper conclusion to be drawn here is that management involvement and user participation, in and of themselves, do not guarantee successful systems. Rather, they are merely important and necessary elements in any major ADP initiative.

Conclusions and Recommendations -- Chapter 5

The draft report concludes that performance management assures greater control over computer resources and enhances planning and systems development efforts.

-- The Mint's performance monitoring efforts need to be part of a systematic management program.

-- Performance management programs could improve computer resource management throughout Treasury.

The draft report recommends that a performance management program be developed for each Bureau. At a minimum, each program should focus on:

(1) Developing performance standards based on specific user requirements, but within the limits of overall capacity and capability;

(2) Periodic and routine monitoring of the efficiency and effectiveness of the Bureaus' computer resources in meeting these requirements;

(3) Consistent and uniform reporting to management of performance trends and areas needing improvement; and

(4) Developing and implementing a long-range strategy for improving performance.

Department of the Treasury Position

In general, the Department concurs with the draft report view of the importance of performance management. If properly applied, certain techniques and procedures can optimize application systems (i.e., reduce the resource requirements and thus the operating costs). This in turn may free up capacity for use by other applications. But certain cautions apply. As in any management program, continuing concern must be given to minimize the costs of system measurement. The advantages of operational improvement must be measured against the cost of the program. Performance management is not a panacea; rather, it must be carefully used to be of any real value. The report does not address these necessary caveats.

Practically every Bureau in the Department has a performance management program in place. The draft report's recommendations provide several useful ideas which the Department will implement in attempting to improve its performance management program.

With respect to the specific problems at Mint and Secret Service, we conducted a Facility Review of both computer centers this year. Our findings contradict those of the draft report:

(1) At the Mint, the major application (Treasury payroll) saturates the system. GAO's assertions of excess capacity are based on the assumption that the system could be fully saturated on nights and wekends. This approach would increase ulitization factors but would be completely cost-ineffective.

(2) At Secret Service, excess capacity occurred because of delays in implementing planned systems. We found that the problem centered on the systems development process, not on excess equipment. The Office of Computer Science, in conjunction with Secret Service, is moving to increase the rate at which planned applications are put on--line. We believe that such an approach is more useful than simply removing equipment which would have to be re-procured eventually because of planned expansions in usage. (We would also note that the existing equipment leasing Contract would actually increase rental charges to the government if a computer were removed.)

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